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# **SYRIA**

## **Agricultural Sector Assessment**

### **Volume 5 Human Resources Annex**

U.S. Department of Agriculture  
in cooperation with the  
U.S. Agency for International Development  
and the  
State Planning Commission  
Syrian Arab Republic

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## Syria: Agricultural Sector Assessment

## Volume 5: Human Resources and Agricultural Institutions Annex

TABLE OF CONTENTS

	Preface
Chapter I	Population and Migration
Chapter II	Agricultural Manpower
Chapter III	Rural Change
Chapter IV	Bedouins in Agriculture
Chapter V	Land Tenure in the Euphrates Basin
Chapter VI	Rural Social Services
Chapter VII	Nutrition
Chapter VIII	Public Administration in Agriculture
Chapter IX	Agricultural Research
Chapter X	Agricultural Extension
Chapter XI	Agricultural Education

PREFACE

As one of the five volumes comprising the Final Report of the Agricultural Sector Assessment, this Annex contains the technical reports which relate to human resources and rural development, as well as to public institutions affecting agriculture. All of the reports, except the one on public administration, were prepared as part of a contract between the U.S. Department of Agriculture (USDA) and the Mid-West Universities' Consortium for International Activities, Inc. (MUCIA). The University of Wisconsin-Madison administered the contract on behalf of MUCIA.

The specialists preparing the technical reports included the following: J. David Stanfield, Coordinator, Land Tenure Center, University of Wisconsin-Madison; James D. Williams, Demographer, University of Illinois, Champaign-Urbana; Lester Schmind, Agricultural

(Continued)

Economist, Southwest State University, Marshall, Minnesota; A. Eugene Havens, Rural Sociologist, University of Wisconsin-Madison; Andrew E. Manzardo, Anthropologist, Land Tenure Center, University of Wisconsin-Madison; Wyn F. Owen, Economist, Economics Institute, University of Colorado-Boulder; Harold Lemel, Development Sociologist, Land Tenure Center, University of Wisconsin-Madison; Dean Wilson, Nutrition Planner, Community Systems Foundation, Ann Arbor, Michigan; Arthur Peterson, Soils Scientist, University of Wisconsin-Madison; Theodore Shannon, University Extension, University of Wisconsin-Madison; and Wilmot Averill, USDA Consultant.

Preliminary drafts of the technical reports were provided to the State Planning Commission (SPC) in September and October 1979. Revised drafts were reviewed by Committees established by the Prime Minister's Office in early 1980. The comments and corrections of these Committees are incorporated to the extent possible into this Final Report.

The Syrian Agricultural Sector Assessment Project was carried out by the Office of International Cooperation and Development, USDA, in cooperation with the U.S. Agency for International Development and the Syrian Arab Republic under PIO/T 276-005-2-80020. The participation of the Syrian Arab Republic was provided through the State Planning Commission of the Prime Minister's Office, under the general direction of Hisham Akhrass, Deputy Minister of State for Planning Affairs, SPC.

The Syrian Agricultural Sector Assessment Project was implemented under the supervision of the resident project staff which included: USDA - William A. Faught, Team Leader and Co-Director; Wendell M. McMillan, Policy Economist; and Calvin C. Boykin, Jr., Production Economist; and SPC-Said Halabi, Co-Director; and Nour Barmada, Assistant Co-Director, who was succeeded during the last six months by Raghad Sheik El-Ard. A complete listing of the many specialists and counterparts who participated in the project are listed in the Appendix to Volume 1.

The Final Report of the Agricultural Sector Assessment contains the following five volumes:

Volume 1 - Summary Report

Volume 2 - Natural Resources Annex

Volume 3 - Agricultural Production Annex

Volume 4 - Agricultural Marketing Annex

Volume 5 - Human Resources and Agricultural Institutions Annex

June 1980

# Syria: Agricultural Sector Assessment

## Volume 5: Human Resources and Agricultural Institutions Annex

### CHAPTER I

#### POPULATION AND MIGRATION

By

James D. Williams

#### TABLE OF CONTENTS

	<u>Page</u>
Preface	1
1. Introduction	2
2. Data Sources, Problems and Methods	2
3. A Global Perspective on Population Changes	3
4. National Forecasts Through the Year 2000	4
Population Projections of the CBS	6
Comments and Cautions on the Projections	11
Projections of Population and Employment	12
5. Fertility: Further Considerations	14
6. Rural - Urban Differentials by Mohafaza	18
7. Migration	25
Migration Flows	26
Patterns of Migration by Mohafaza	30
8. Concluding Remarks	42
9. Summary of Major Findings	43
10. Recommendations	44
Sources	47
Appendix I	49



## Preface

A first report, written in March 1979, reflected information and data gathered from numerous persons in various Ministries during late January, February, and early March, 1979. A revised report was prepared which reflected comments on the first report which were gathered from visits to the Central Bureau of Statistics, the Ministry of Planning, the Ministry of Labor and Social Affairs, and the Ministry of Agriculture during a two-week return visit in May, 1979.

In these short visits it is possible to come to understand only the most obvious facts of Syrian society which affect demographic behaviors. Demographic analysis depends upon recognition of complex and subtle relationships between demographic, social, economic and political variables. Projection of the demographic future of a population is hazardous, especially where there is limited information upon which to base a projection, as is the case in Syria, despite the excellent initial work begun in the CBS and SPC. Nonetheless, it is hoped that the information summarized in this report will help to advance the planning for the future of Syrian agriculture.



## 1. Introduction

The fundamental parameters of concern in the following report are dictated by the central balancing equation of demographic analysis which states that the total change in a population is equal to births minus deaths plus immigrants minus outmigrants. Where a total national population is being considered, migrants from other countries are called immigrants and migrants to other countries, emmigrants. The primary concerns of this report are fertility and migration; mortality will be briefly considered. These demographic factors will be treated in the context of industrialization and economic development and especially the general process of urbanization in Syria.

## 2. Data Sources, Problems and Methods

There are two major sources for demographic data. From a census is obtained a count of a population and additional descriptive information on that population. Vital events, births, and deaths, are incompletely estimated using census data alone. Thus, vital events data are usually obtained from a registration system. While Syria conducted reasonably good censuses in 1960 and 1970, with improvement in 1970, the country as yet lacks a registration system which is complete enough for use in obtaining counts of vital events. High priority should be placed on upgrading the vital events registration system so that vital rates may be monitored on a continuous rather than sporadic basis.

While there are indirect techniques for estimating vital events from census data alone, the Central Bureau of Statistics (CBS) has undertaken an excellent research program for estimation of demographic rates in the Syrian population. One aspect of this program, begun in 1976, is a follow-up survey of stratified longitudinal design which will continue for three years. This survey will provide good estimates of fertility and mortality as well as some information on migration. Only one year of data were available for the first draft of this report, enough for estimating the needed fertility and mortality data, but not yet enough for analyses of migration, either internal or external. By the time of my return visit, some second year data had become available which provided fertility and mortality estimates similar to the first year results. First year results are retained in this revised report, though some second year follow-up survey results will be noted. Population census counts used in this report include the 1960 and 1970 complete enumerations, and the 1976 sample census. Certain deficiencies in the censuses preclude a rigorous analysis of migration, although the data are sufficient to explore this phenomenon somewhat (see Annex I for a discussion of the problems with the censuses).



Data on immigration and emmigration are not available in Syria, though later this year the Follow-up Survey may be able to provide a basis for estimation with some degree of accuracy. Indirect estimation techniques have been attempted but with only limited success. In general, indirect estimation of net international migration is performed by calculating total population change over an interval of time adding births and subtracting deaths from the initial population. The difference between the result and the following census is a result of migration. Even for the period 1970-1976 where two censuses are available, however, the data for estimating births and deaths are not adequate to determine the residual migration component. This technique does not yet yield worthwhile estimates of migration for the national population to be used for anything but a very rough indication of trends.

### 3 A Global Perspective on Population Changes

The general model of demographic transition suggest that most populations experience a period of rapid growth in numbers during a period of industrialization and economic development. The population growth results from an imbalance between the two factors of natural increase, births and deaths. Except in unusual situations, or for small populations, national growth is primarily a function of the difference between birth and death rates, forming the rate of natural increase. Death control is virtually universally acceptable and is being accomplished rapidly throughout the world. Thus, the past decades have witnessed astonishing declines in the levels of mortality in many countries, Syria included. Data from the 1976-77 Follow-up Demographic Survey conducted by the Central Bureau of Statistics estimated the death rate at that time to be about 8.5 per 1000. Second year results confirm this figure for the total population. Age-specific mortality rates, and life table analyses suggest that the mortality curve for Syria has probably passed its period of sharpest decline and future improvements in life expectancies are likely to come more slowly than in the past decade.

In contrast, fertility remains high in Syria. On the basis of the Western model of "demographic transition," some demographers anticipate that currently developing countries will experience fertility declines following mortality declines as modernization proceeds. It is not known how well the Western model of transition may serve as a basis for prediction in currently developing countries. There are two major reasons for the uncertainty: (1) demographic transition and modernization/industrialization evolved together in the West and over long periods of time; in contrast, death control may be imported to a developing country long before that country achieves significant economic growth; and (2) it is not known how the radically differing social, and particularly cultural contexts of development may affect the transition model when applied to various countries of the world. It appears that death control may take place many years before a culture evolves a lowered fertility norm of behavior.

In general, demographic theory presumes that high fertility is biologically necessary in a society with high mortality. The preservation of population is ensured through reproduction at high rates and this situation is supported by elaborate social mechanisms which ensure that enough children will be born to offset high infant mortality rates. When mortality is dramatically reduced, often by 50 percent in just a few years, the high fertility norms remain. Some of the factors which cause a shift from high to low fertility behavior are known. Most important is the presumed rationality of people in urban industrial societies wherein children become viewed as economic liabilities beyond some optimum number.

Syria at this time is in its high growth phase with low mortality and high fertility. The 1976-77 data suggest a birth rate of about 46 per 1000. The rate of natural increase can be placed into perspective by examining Figure 1 which plots birth and death rates for several countries and areas.

It is apparent that the death rate is quite low in Syria. In part this reflects the relatively young Syrian population with a substantial portion of its members at low mortality ages. The "crude" death rates do not control for age composition and caution is exercised in making comparisons. Moreover, if the crude death rate is this low, and there is good reason to believe it is, then it has probably fallen rapidly in recent years and, therefore, it would have been higher in 1973, the year for data for the other countries in Figure 1.

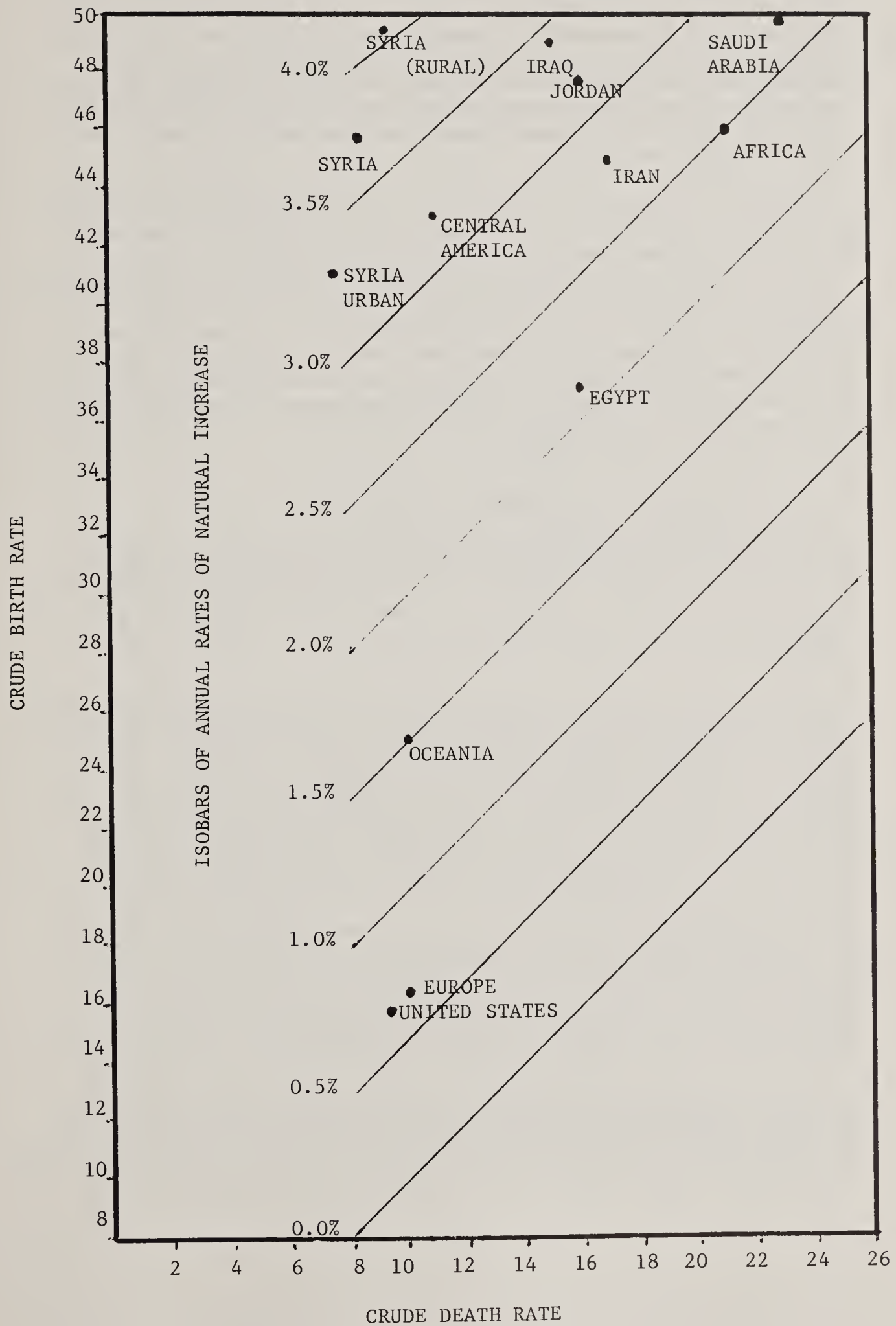
Data on fertility appear to be excellent and the assumption is that the crude birth rate is quite high in the country, with a considerable and common differential between rural and urban levels. Second year survey results confirm the fertility levels of the first year. Taking the difference between birth and death rates, Syria is currently experiencing one of the highest annual rates of natural increase recorded in a sizeable modern society.

#### 4. National Forecasts Through the Year 2000

On the basis of the findings of the Follow-up Survey, which has provided fertility and mortality estimates in appropriate detail, the Central Bureau of Statistics has completed a series of forecasts of future population growth. These projections, by age, sex and Mohafaza have been carefully prepared and their methodologies require some comment and elaboration.

Population projection has been performed in most countries using a variety of mostly unsatisfactory techniques. Like the weather, population projections and forecasts tend to become increasingly difficult in developing countries where birth rates are likely to change suddenly. One technique, simple extrapolation of past growth rates into the future, is completely unsatisfactory for developing countries because of the changes of rapidly shifting vital rates.

FIGURE 1 NATURAL INCREASE, SYRIA, 1976-77; OTHER AREAS, 1973





Whenever possible, more satisfactory projections are made using the component method wherein the elements of basic balancing equation are divided up, projected separately, and then reassembled. This approach is especially useful, since the different sources of growth can generally be forecast with differing degrees of accuracy and, as time passes and new data are collected, only certain subsections of the forecast may need revision. The forecasts of Syrian growth have been prepared using a modification of standard component techniques.

In order to prepare a projection, several pieces of information need to be gathered. First, a count by age and sex of the total population at some initial starting point is required. Then accurate age-specific fertility and mortality rates as well as relevant migration rates need to be obtained. Optimally, for national projections, national net im- and emmigration data by age and sex are needed. For projections by subareas, such as Mohafazat, their net internal migration rates, by age and sex are required. In this report the primary concern is with the national total population projections which require separate estimates of future trends in fertility, mortality and migration.

#### 4.1 Population Projections of the CBS

The projections of the Central Bureau of Statistics are based upon the initial count provided by the 1970 census of population and the 1976-77 Follow-up Survey which provided fertility and mortality information. However, these projections ignore migration completely and forecasts are based solely upon trends in natural increase.

Let us consider the exclusion of the migration component further. There is little basis for quantification of international migration flows for estimating net migration into or out of Syria. It is commonly observed that there is much movement across the borders of Syria which appears to be mainly economically motivated. Syrian males are not isolated from international, and especially other Arab, labor markets. This data, however, has proven unreliable in the face of conversations with persons here and supplementary analysis. The Follow-up Survey for the first year has estimated annual immigration of about one percent and emmigration of nearly 2.5 percent, suggesting net emmigration of 1.5 percent per year. This would suggest a 1977 loss of nearly 115,000 persons with presumably "extra" weighty losses among young adult males who are usually the most prone to international migration. However, I can find no supporting evidence for this magnitude of net loss annually.

First, the age and sex structure of the population in 1976 does not show enough anomalies for us to assume that rate of net emmigration had prevailed for several years. Even more startling, though,

is the result of a comparison of the 1976 population estimated by the sample census and a 1976 projection. Based solely upon the currently assumed level of natural increase since 1970, the projection is only slightly less than the 1976 population independently estimated by sample census. These data clearly suggest the reverse of what would be expected if there were sizeable net emmigration. It is likely that immigration from Lebanon may have temporarily resulted in net immigration. Preliminary second year survey results now show little net migration into or out of Syria. The evidence suggests that for the time being the estimation or measurement of migration into and out of the country remains difficult. Since there is evidence to contradict the idea that there is sizeable net outmigration from the country, it seems reasonable to prepare projections ignoring net national migration patterns.

With regard to the general perception of sizeable international labor migration, conversations with several persons and field observations lend some support to the possibility that there is indeed a sizeable flow out of the country, but also a sizeable return flow such that over a period of time there appears to be a relatively small net gain or loss. This situation is becoming increasingly common in many countries and mirrors events in the past history of some countries' rural to urban migration. It may well be the case that people are going to other countries for short periods of time to capitalize on short term employment opportunities in a particular location. Thus, there is relatively small net migration over long periods of time.

Using age-specific mortality data from the Follow-up Survey, a life table was prepared at the Central Bureau of Statistics with a resulting estimate of expectation of life at birth of about 63 years. Mortality in the future has been projected using United Nations model life tables and assuming a regular trend in improvement. The model life tables used are levels 80 through 105 with corresponding expectations of life as shown in Table 1. It seems likely that these guesses about the future which do not reflect symptomatic analysis of trends (since none have been performed), would only prove optimistic; and for planning purposes they may be a source of slight overestimation of population at future dates.

Some concern exists in Syria over what is judged to be a surprisingly low level of mortality in the country in comparison with other past estimates. Judgement on this matter must be made primarily on the basis of the quality of measurement techniques and data sources. In this case, the Follow-up Survey is not without problems, but it is the best source of information on mortality in Syria at this time. It is a direct measurement rather than an indirect estimate as performed by others. Furthermore, we should not be surprised if Syria has undergone rapid declines in mortality, particularly infant mortality, in recent years. And, finally, I would note that even if mortality were a bit higher than these

TABLE 1: Life Expectancy Forecasts

<u>Period</u>	<u>Expectation of Life</u>
1970-75	60.4 years
1975-80	63.2 "
1980-85	65.8 "
1985-90	68.2 "
1990-95	70.2 "
1995-2000	71.7 "

figures suggest, the error will not have a very great quantitative effect on projections. More important at this point in Syrian development is the estimation of future fertility trends which is the crucial component of the population projections.

The Central Bureau of Statistic's analysis of future fertility trends links future demographic behavior to expectations based upon relationships between social and demographic variables in Syria. It is widely recognized that modernization and education are closely linked and that, in turn, education is closely related to fertility performance in many countries. Syria is no exception. Though arguments persist over the true causality embedded within the relationships, it is the case that better-educated women tend to have fewer children. The magnitude of this relationship is suggested in Figure 2 using data from the 1976-77 Follow-up Survey, first year results.

While the total fertility rate (TFR) for the total population of women ages 15-49 is estimated at approximately 7.5, the TFR for women with an intermediate level of education is approximately 4.2. The national population projection is dependent upon assumptions that education levels will increase among women through the year 2000, and that the relationship between education and fertility will remain strong. The fertility projection is that the fertility level of the entire female population in 2000 will average the same as that of intermediate educated women in 1976. Over time, the changing levels are forecast as follows:<sup>2</sup>

TABLE 2: Forecasts of Total Fertility Rates

<u>Period</u>	<u>TFR</u>
1970-75	7.5
1975-80	7.5
1980-85	6.7
1985-90	5.9
1990-95	5.1
1995-2000	4.2



Since the TFR is simply a sum of age specific fertility rates, it controls for age composition. The decline in total fertility indicated above is transformed to age-specific rates simply by decreasing the fertility levels at each age grouping by 11 percent beginning in 1980-85. The age specific birth rates obtained from the first year survey results and used for 1970-75 and 1975-80 are as follows (numbers in parentheses are second year and first year combined results, showing high stability in the fertility rate estimates):

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TABLE 3: Age-Specific Birthrates (from Survey Data)

<u>Age</u>	<u>Age-Specific Birthrates</u>
15-19	.131 (.125)
20-24	.312 (.315)
25-29	.371 (.368)
30-34	.316 (.313)
35-39	.224 (.230)
40-44	.110 (.105)
45-49	.034 (.036)

Average Age at Childbearing = 29.7

Sex Ratio at Birth = 104

---

This fertility forecast completes the prerequisites for a population forecast or projection. Detailed data by age and sex, and for that matter, by Mohafaza are available from the Central Bureau of Statistics. The highlights of the results can be seen in the following table which clearly shows a rapidly growing population even in the face of fertility decline.<sup>3</sup>

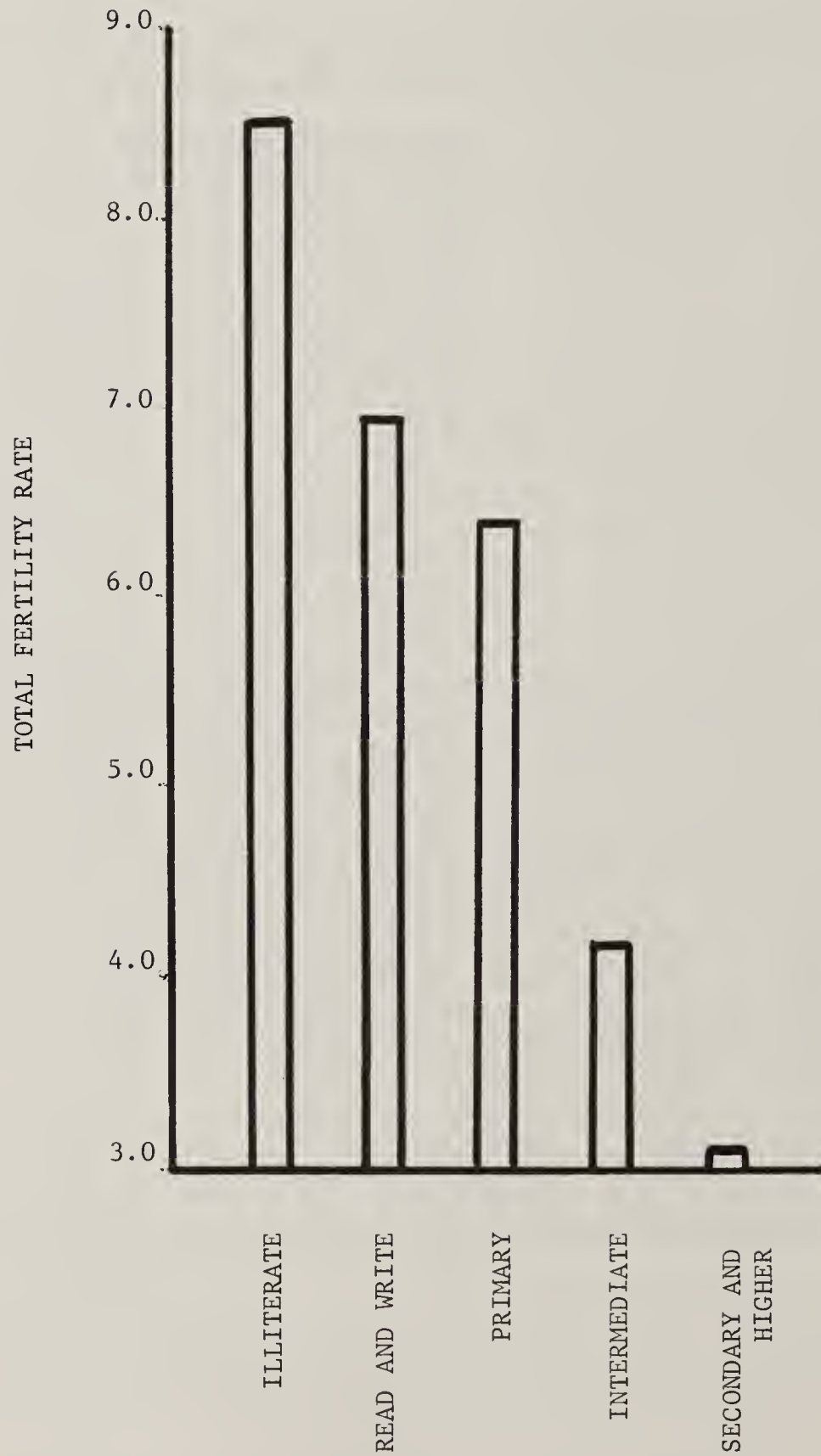
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TABLE 4: Population Projections Through 2000

<u>Year</u>	<u>Male (000)</u>	<u>Female (000)</u>	<u>Total (000)</u>	<u>Annual Growth Rate To End Date (00)</u>
1975	3798	3640	7438	3.52
1980	4570	4409	8979	3.84
1985	5479	5302	10781	3.73
1990	6481	6293	12774	3.45
1995	7565	7357	14922	3.16
2000	8656	8429	17085	2.74

---

FIGURE 2 FERTILITY PERFORMANCE BY EDUCATION ATTAINMENT, 1976-77





The fact that the population will continue to grow rapidly even after considerable fertility decline is not a function of mortality decline but of a principle known as demographic momentum. As of 1970, the age structure of the population was such that the coming years would see increasing absolute numbers of women entering the childbearing ages. Even a constant schedule of fertility rates would produce increasing absolute numbers of births. From a planning point of view, demographic momentum is a very important property of a population. In essence, it means that even in the unlikely event that tomorrow Syria could achieve replacement level fertility, if desired, the total population would continue to grow for many years. Conversely, desired rates of natural increase 15 or more years in the future are a function of fertility changes which must be made today.

#### 4.2 Comments and Cautions on the Projections

These projections are tentative, especially for years beyond 1985; they are, however, valuable as a guide to the magnitude of potential for population growth in the future. The Central Bureau of Statistics will prepare revised projections later this year when more data become available and I suggest that the Planning Commission express its informational needs before those projects are begun. Specifically, while the absolute numbers tend to be of only limited value, projections are models based upon sets of assumptions. The Planning Commission would find a series of projections based upon these assumptions quite useful in spelling out the implications of different scenarios of demographic change.

As to the future accuracy of the CBS February projections, the major issues are the projected trends in mortality and fertility. Mortality issues have been discussed and we are left to consider the most important concern of whether or not the assumed 11 percent annual decline in total fertility beginning 1980-85 is reasonable. This CBS assumption is likely to be overly optimistic and produce projections which will be too low. First, an 11 percent five year decline in 1980-85 would be a very fast decline even in comparison to other developing countries with a family planning program actively underway. Family planning in Syria is in an infant stage of development and will contribute little unless actively supported and developed. Moreover, it is virtually certain that a fertility decline, when it comes, will not be linear over time as assumed by these CBS projections. Fertility declines will begin slowly, perhaps reaching 11 percent by 1995-2000 but not in 1980-85. Thus, we may see that the CBS projections probably underestimate the future population of Syria and that these underestimates will be particularly large in 1985, 1990, and 1995, since a fertility decline will accelerate from a rather slow start.

New projections which reflect this thinking and will incorporate the second year Follow-up Survey results will be prepared in June 1979. These new projections will be more current and should be used for planning purposes until there is reason to construct a new set of projections for the total population.

#### 4.3 Projections of Population and Employment

Let us consider the implications of the previous assumed future trends for the changing sex and age structure of the population. Age structure, of course, is a primary determinant of proportional labor force size and the dependency ratio, and provides direct information on labor potential, both male and female. The age structures from the census of 1970, and projected for the year 2000, are shown in Figure 3.

The results suggest that if the forecasts prove accurate and fertility does decline, there will be improvement in the relative proportions of the population who will be 15 to 64 versus those under 15 and over 65. The latter group, so-called dependents, accounted for about 53 percent of the population in 1970 and will account for about 44 percent in the year 2000. This improvement is virtually entirely dependent upon a future decline in fertility, an uncertainty at best.

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TABLE 5: Projected Employment Levels

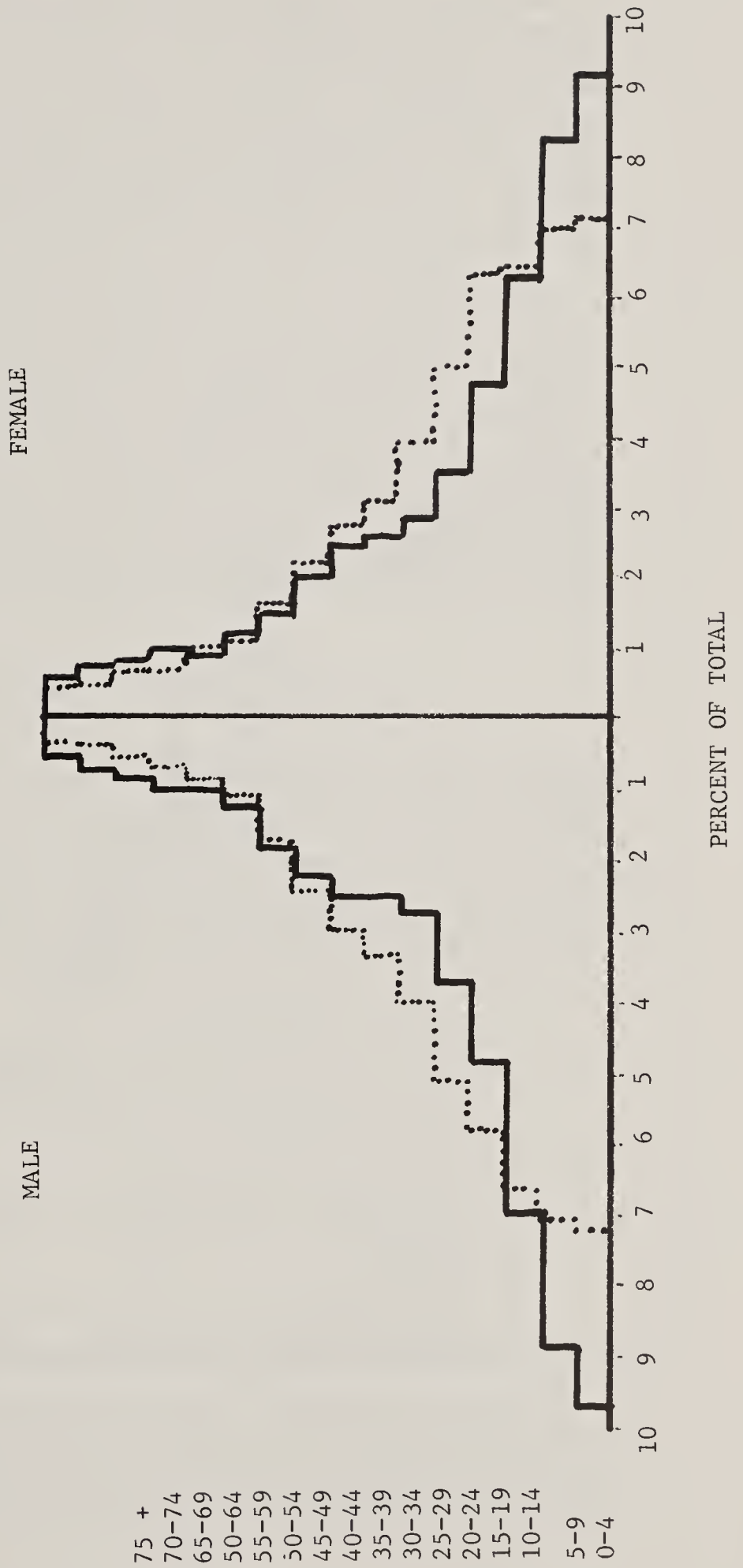
Age	1970 Total Pop.	1970 Employed (000's)	1970 Rate	1990 Total (000's)	1990 Projected Employed (000's)
10-14	813	94	.115	1747	206
15-19	582	171	.295	1374	406
20-24	444	191	.430	1113	479
25-29	337	161	.478	1022	489
30-34	310	156	.503	793	399
35-39	307	159	.519	585	304
40-44	255	137	.536	434	233
45-49	197	104	.528	340	190
50-54	149	74	.500	293	147
55-59	114	55	.482	261	126
60-64	126	52	.412	211	87
65-69	83	30	.365	149	54
70-74	83	25	.301	97	29
75+	102	20	.193	109	21
TOTAL	3899	1429	.366	8528	3160

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FIGURE 3 COMPARATIVE AGE STRUCTURES FOR 1970 AND 2000 (PROJECTED).

.....2000  
 \_\_\_\_\_1970



At current employment rates (1970), the population projections shown in Table 5 suggest that the absolute number of employed must be more than doubled by 1990, from about 1.4 million to about 3.2 million persons. This future growth will, by 1990, primarily be among persons from ages 20 to 34. Whereas this age group accounted for about 36 percent of employed persons in 1970, the projections suggest it will account for about 43 percent of employed persons by 1990. Comparative age structures of the employed labor force are displayed in Figure 4 for 1970 and the projected 1990 data.

These numbers of employed persons assume no changes in employment rates in the total population between 1970 and 1990. Syria already evidences future growth in the labor force participation rate for females. In absolute numbers, this means that there will probably be more than 3.16 million persons wanting employment in 1990. Overall, we see in these data a clear indication of the future investment requirements for educating and providing skills training for tremendous numbers of entrants to the future labor force. The projection itself is probably a low estimate of growth to 1990. The country must begin now to plan for an orderly, rapid increase in job opportunities for this growing population at labor force ages.

#### 5. Fertility: Further Considerations

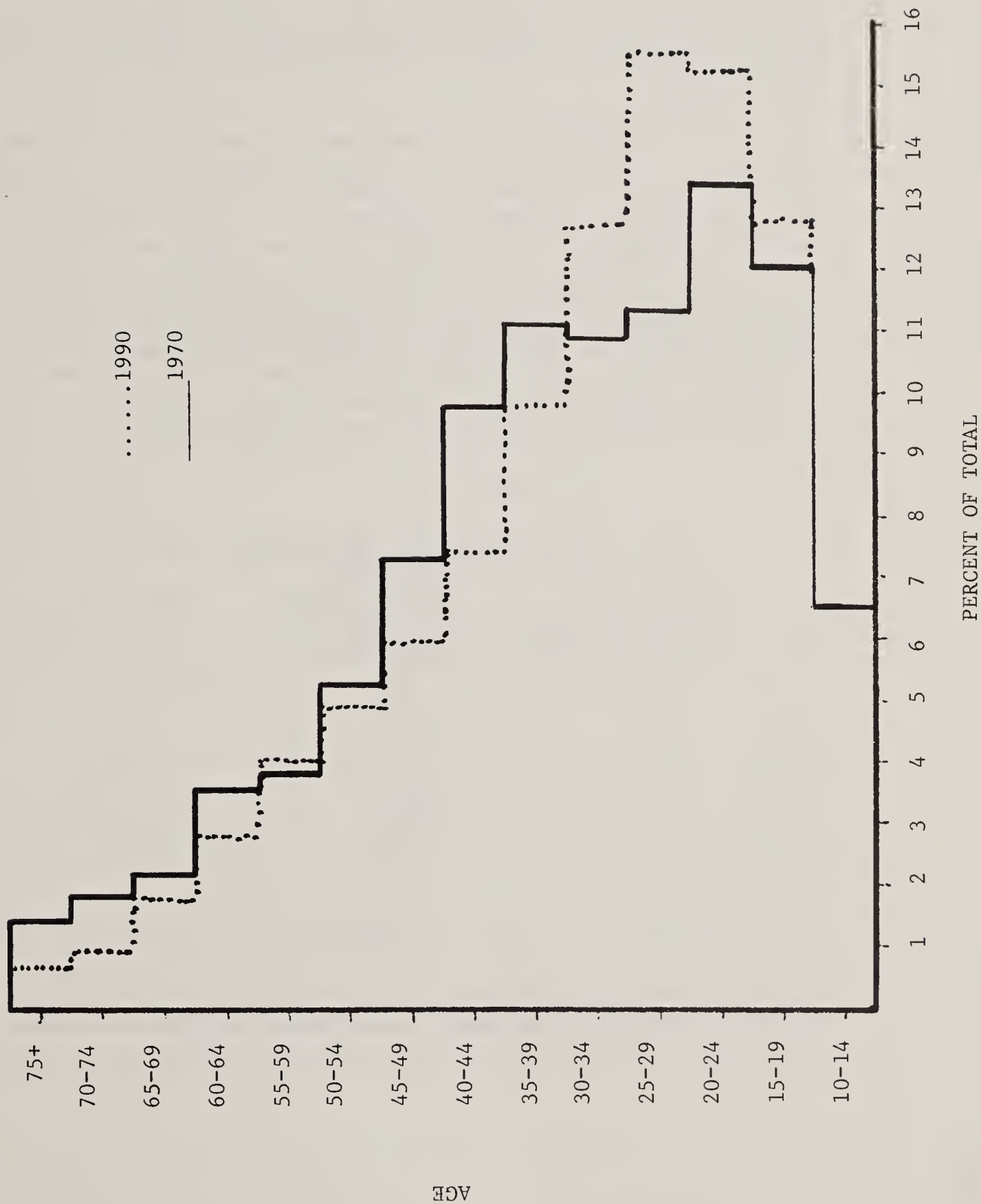
The national projections which have been discussed above are dependent, quantitatively, upon a decline in fertility which will presumably result from improved levels of education among women. However, fertility is only indirectly influenced by socio-economic, cultural or environmental variables. Educational levels, for instance, have no direct effect upon fertility. Rather, fertility is affected by what have been termed intermediate or "in-between" variables which can be listed as follows:

- I. Exposure to Having Children
  - 1. proportion marrying
- II. Deliberate Marital Fertility Control
  - 2. contraception (family planning to avoid conception)
  - 3. induced abortion
- III. Natural Marital Fertility
  - 4. lactational infecundability (infertility while nursing)
  - 5. frequency of intercourse
  - 6. sterility
  - 7. spontaneous intrauterine mortality (stillborn child, natural abortion)
  - 8. Duration of the fertile period (years able to have children).

Much of the subsequent discussion draws upon Allan G. Hill's use of this framework to analyze Syrian fertility. His paper, "The Impact of Socio-Economic Factors on Fertility and an Analytical Framework for Predicting Fertility Trends with Reference to Syria," was



FIGURE 4 COMPARATIVE AGE DISTRIBUTION OF THE EMPLOYED LABOR FORCE, 1970 AND 1990



presented September 1978 at a seminar on Factors of Population Growth and its Future Trends, organized by the CBS and the UNFPA.

The important socio-economic factor, education, and for that matter its correlate of occupational level, is generally presumed to operate on fertility by opening up to the individual a wider range of possible living styles and thus affords an incentive to reduce family size. Furthermore, more widely educated persons know how to put lower fertility desires into effect. Social mobility provides a new set of values to substitute for traditional high fertility norms.

For planning purposes, we should concentrate on three of the intermediate variables: (1) the proportions marrying; (2) contraceptive use; and (3) duration of the marital fertile period. Educational attainment, and for that matter labor force participation and social mobility via occupation, tend to result in lower total proportions marrying, greater use of contraceptives, and later marriage and thus a shorter period of marital fertility. By far, the most effective and fastest way to reduce fertility is via contraception. However, reductions in proportions marrying and increases in average ages at marriage are significant factors and should not be ignored. The effect of proportions marrying can be seen in the following example from Dr. Hill's paper (Table 6).<sup>5</sup>

TABLE 6: <u>Fertility Rates and Marriage Rates</u>			
		Urban Women	
	Marital Age	Working Outside	Rural Women
	Specific Fertility	Their Homes:	in the Labor Force
Age	1976 (000's)	% Married 1970	% Married 1970
15-19	368	4.61	30.67
20-24	457	23.25	74.40
25-29	441	47.46	91.29
30-34	350	60.09	95.00
35-39	263	63.37	95.71
40-44	139	56.14	93.08
45-49	47	52.61	90.85
TFR	10.3	4.1	7.5

The difference in TFRs of 7.5 for nonworking rural women and 4.1 for urban women working outside their homes is substantial and in this example, entirely due to the differing proportions married.

The above comments suggest that planning should monitor over the coming years the basic element in the national population projections, fertility. Careful monitoring of the relationships between education levels, proportions marrying, contraceptive useage, age at marriage, and fertility will show how well, and how, the proposed decline in the TFR from 1970 to 2000 is progressing.

It is presumed that modernization will take place and its effects will filter through this system of variables at its own pace, and in its own way, to achieve lower fertility without direct intervention. Careful monitoring of the system will be the only direct effort in the area of fertility under this approach. Yet, should more active intervention be deemed desirable, the fertility model provides a basis for departure.

Two distinct policy alternatives which have lowered fertility as their outcome are possible. The first is to identify, for the Syrian population, those factors which are most closely related to the intermediate fertility variables, and then to attempt to effect favorable changes in levels of the indirect, causally prior variables. Thus, policies might be designed to raise educational attainment levels or bring women into the labor force, both of which should result in overall fertility reductions. This is because better educated working women will tend to use contraception, marry in lower total proportions, and marry later in their lives after the passage of some of their most fertile years.

Should it be deemed necessary to effect more rapid and more assured declines in fertility, a second policy alternative is to influence directly the magnitude of the relationship between factors, such as education, and intermediate variables. Thus, for example, programs such as family planning, which make contraceptives available and socially acceptable, can increase the magnitude of the relationship between education and contraceptive use and will directly affect the level of contraceptive use.

To summarize, Syria faces a certain future of rapid population growth, and some idea of the rapidity of that growth has been suggested in the population projections. Indeed, these projections probably underestimate the future growth. These projections, however, assume an education-related fertility decline over the coming two decades. I have in this section elaborated on how fertility declines come about in terms of the more important variables and how policy alternatives can affect fertility decreases. If planners decide that population growth is rapid, the processes of social change can be analyzed so as to identify components which could be subject to various intervention strategies. Even with no change in policy, I would underscore the need to monitor, via research, the

variables and relationships which alter fertility. It is not yet known how well the system works in non-Western countries, and especially in the Middle East. Thus, for example, there is evidence that at least for a short time, rising standards of living and social mobility can actually increase fertility as those with traditional high fertility ways of thinking acquire the means to have more children before they acquire a lower fertility point of view.

The Syrian population contains a tremendous demographic momentum. With so many young women in the age composition moving into their fertile years, even very low fertility rates would result in considerable absolute growth. A difference of a few tenths of the TFR decline projected to 2000 (but not realized) will mean large unanticipated absolute numbers of new mouths to feed, the need to shelter, school, and jobs in later years.

#### 6. Rural - Urban Differentials by Mohafaza

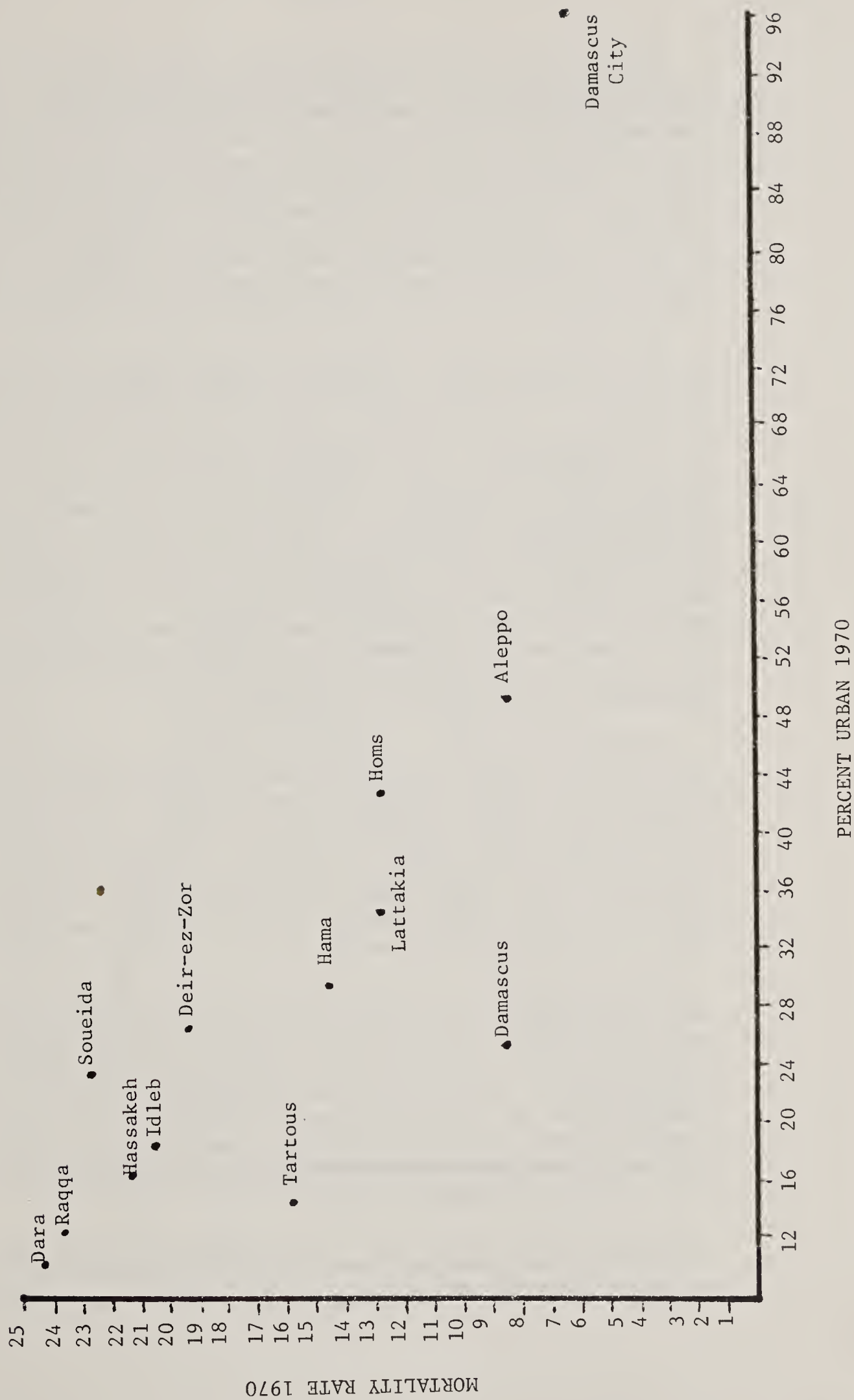
Mortality differentials associated with urban versus rural life generally reflect differences in standards of living, as well as cultural traditions, and availability of health care services. The 1976-77 data from the Follow-up Demographic Survey suggest that rural-urban differentials in mortality persist in Syria. While the crude death rate for the entire country is about 8.5, it is about 7.5 in urban areas and 9.5 in rural areas. To a considerable extent, the total difference is attributable to sizeable differences in mortality in the first year of life, infant mortality. The Follow-up Survey (first year results) estimates the Infant Mortality Rate (IMR) in urban areas at about 58.0 and 71.7 in rural areas, with an average of 65.5 in the total population.

Further elaboration on the general relationship between mortality levels and urbanization is provided in Figure 5 using 1970 census results and calculations presented by Nabil F. Khoury in a paper, "Inter-Relationship Between Urbanization and Socio-Economic Changes: The Case of Syria," at the 1978 Seminar on Factors of Population Growth and its Future Trends (CBS-UNFPA). There, we see that areas with higher proportions of the population living in rural communities have substantially higher mortality. Urban centers seem to provide better health environments in general. Certainly further efforts should be made to reduce infant mortality, especially in rural areas.

The relationship between fertility and urbanization is not nearly so straight forward. The inducements to control fertility vary according to a person's place in a particular social structure. The social structure, however, is not uniform and so fertility decline should not be expected to proceed evenly throughout a society.



FIGURE 5 RELATIONSHIP BETWEEN MORTALITY AND LEVEL OF URBANIZATION, 1970



Data from the Follow-up Survey (first year data only) suggest the expected fertility differentials as noted in Figure 1. The urban crude birth rate was about 41 and the rural about 49.5. The more refined measure, the Total Fertility Rate, which controls for differences in age composition, suggests an even larger differential. The TFR from the Follow-up Survey (first and second year data combined) for urban areas was about 6.1 and for rural areas about 8.8. The age pattern for 1976-78 is presented in Figure 6. We may note that age-specific birth rates are higher in rural areas at all age groups. However, among women at the youngest and oldest ages, there is a very narrow gap between urban and rural levels.

The basis for these differentials is not easily analyzed using available Syrian data. In general though, urban-rural differentials do not derive from the direct effect of urban or rural physical environments. Instead, there are important rural-urban differences in the composition of the respective populations in terms of factors more closely linked to the intermediate fertility variables. Among these factors is education. We know from the Follow-up Survey that the rural female population at childbearing ages will be less educated than their urban counterparts. The Follow-up Survey (first year results) estimates illiteracy to be about 85 percent among women aged 15-49 in rural areas, but only 41 percent in urban areas. Figure 2 demonstrates an important relationship between education and fertility. Thus, we should suspect that much of the difference between fertility rates in rural and urban areas is a function of differing educational compositions in the populations.

To demonstrate this, I have obtained levels of fertility for groups with different amounts of education, and separate information for rural and urban women, from the first and second year combined demographic Follow-up Survey results. The graph of these fertility rates is presented in Figure 7. Controlling for education, we find a much different picture of rural and urban fertility differences. It is only among illiterates that we find higher fertility rates in rural areas. Among all other women, we find higher fertility in urban areas.

Figure 7, however, does not tell us the whole story. Some of the explanation for this result lies in the fact that the rural and urban sectors have different age structures, and we should really compare rural and urban fertility rates controlling for both education and age. The necessary full tabulation of data is not yet available from the Follow-up Survey. However, since there are sizeable numbers of illiterates in the sample, we can look at rural and urban age-specific fertility rates for illiterate women only. This is presented in Figure 8.

In Figure 7 we found that urban illiterate women was the only educational group that had lower fertility than their rural counterparts. This pattern generally holds up after controlling for age

FIGURE 6 AGE-SPECIFIC FERTILITY BY RURAL AND URBAN RESIDENCE, 1976-78

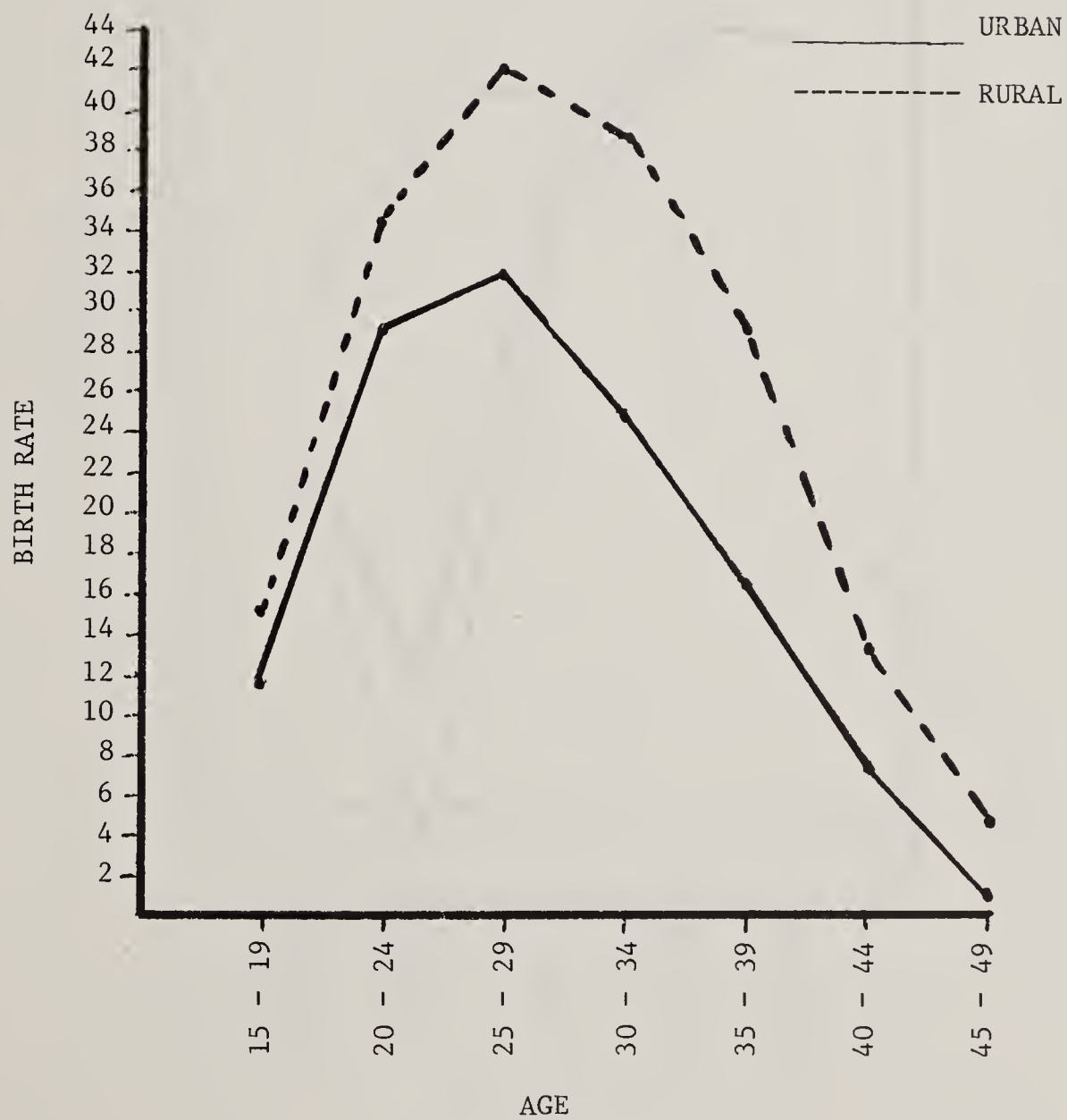


FIGURE 7 EDUCATION SPECIFIC FERTILITY BY RURAL AND URBAN RESIDENCE, 1976-78

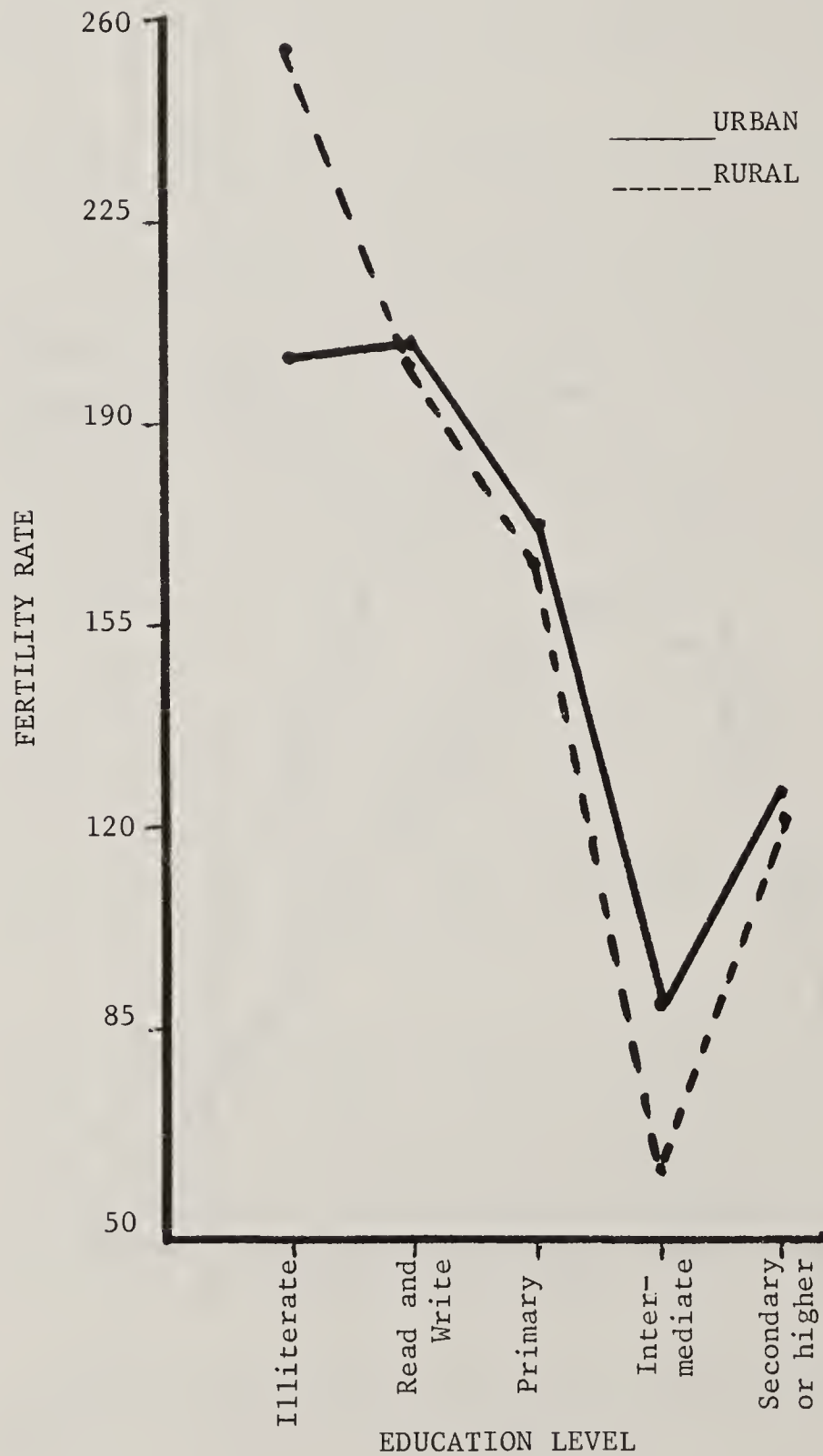
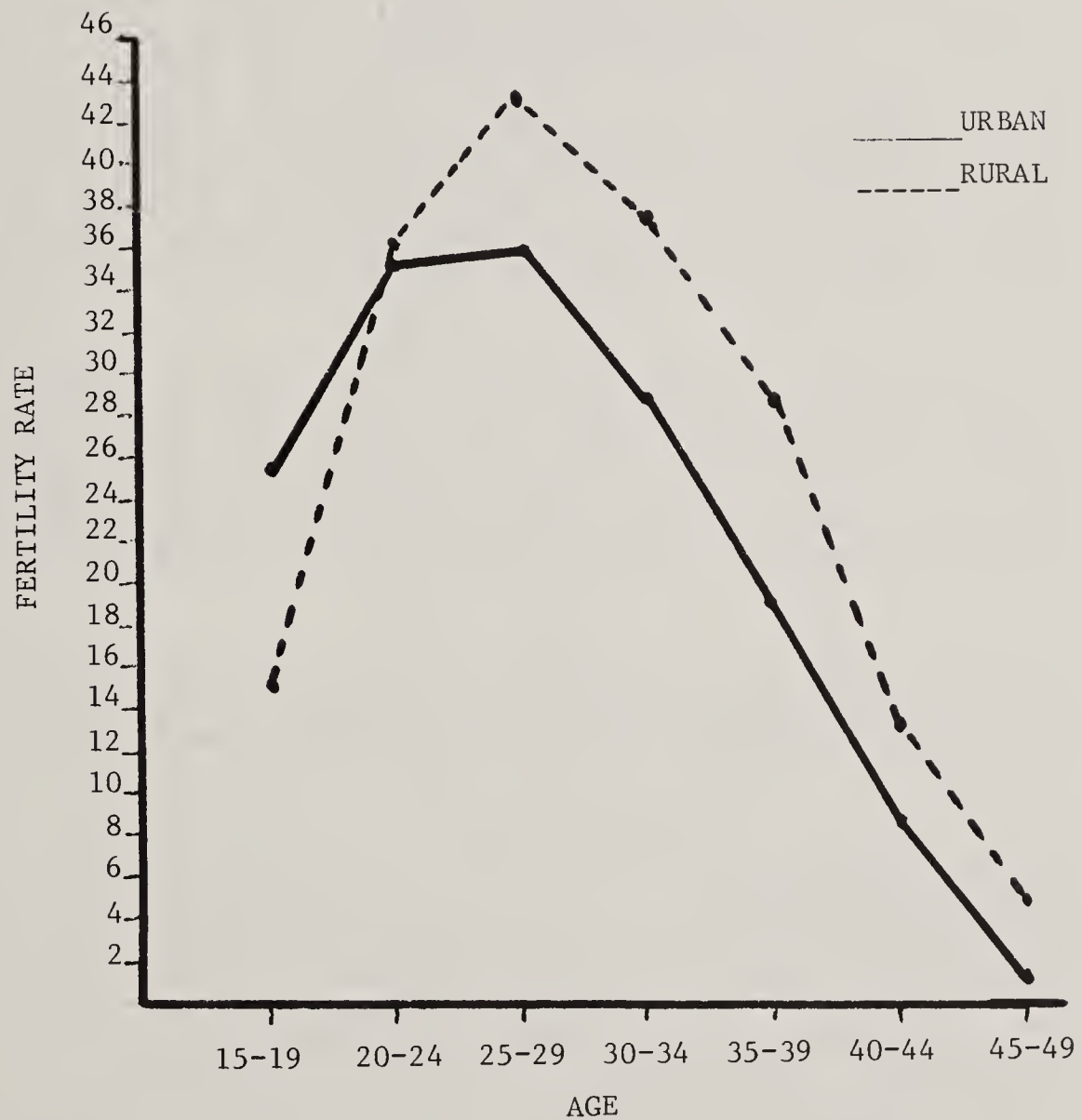


FIGURE 8 AGE SPECIFIC FERTILITY BY RURAL AND URBAN RESIDENCE, 1976-78  
(ILLITERATE WOMEN ONLY)





in Figure 8. But we do see a surprising exception. Among young illiterate women (ages 15-19) urban fertility rates are higher than rural rates. Analysis of migration suggest that rural to urban flows, as best as can be analyzed in their published form, have been composed of sizeable numbers of young, illiterate women. Thus, the young urban illiterate women in Figure 8 data may reflect to an important extent the fertility performance of rural to urban migrants.

Two patterns observed in other countries could help explain the higher urban fertility levels among poorly educated young women in Syria. The two processes known to have resulted in unusually high fertility among rural to urban migrants concern how migrants fare in the urban system of social mobility. First, in some parts of the world, rural to urban migrants have experienced very rapid advancement in standards of living relative to their rural origins. This is especially the case if these young women are joining "successful" husbands who went to the city earlier. Indeed, the means to have children, in this model, are acquired while the individual retains a high fertility norm. These high fertility young urban women may comprise, importantly, immigrants who have acquired the means to have children, and do so under a normative structure that rewards childbearing as a sign of affluence.

An alternative explanation suggests that immigrants have not experienced social mobility that leads to the rapid acquisition of a lower fertility norm. This, of course, assumes that migrants who advance in social class will show lower fertility while those who don't will continue acting upon high fertility norms. Unfortunately, little can be done to directly test these ideas until more data becomes available from the Follow-up Survey.

As a conclusion to this section, and as an introduction to the migration analysis, let us look at regional variations in the natural increase component of population growth. The national projections have been prepared by the Central Bureau of Statistics, for Mohafazat, in such a way as to reflect differential levels in the birth and death components of total population growth for the various regions of the country. While too unstable to be used in planning, the Mohafazat projections do provide the basis for a demonstration of how little effect regional variations in natural increase will have on the future distribution of the Syrian population. In Table 7, I have displayed the percentage distribution of the Syrian population, by Mohafaza, from 1970 census data, as well as the projected 2000 distribution based only on differing rates of natural increase as a source of growth. Finally, I have included the 1976 estimated distribution from sample census data. The 1970 and 1976 data are available in CBS publication 349/1/221-77, "Certain Demographic Indicators. Results of Population Census by Sample, 1976."

From 1970 to the year 2000, and based only on differential natural increase, we find little change in the percent distribution. When we compare these changes with observed 1970-76 changes, we see how important migration is as a component of regional growth variation. Based only on natural increase, we see that Damascus City as one example, would be expected to decline from 13.3 percent in 1970 to 12.7 percent in 2000 (see Table 7). Yet, by 1976, it had increased its share to 14 percent. Analysis shows that the migration patterns are clearly an important determinant of regional growth patterns.

TABLE 7: Percentage Distribution  
of Population by Mohafaza

	1970 Census	2000 Projected	1976 Estimate
Damascus City	13.3	12.7	14.0
Damascus	9.8	10.0	9.9
Homs	8.7	9.0	8.5
Hama	8.2	8.8	8.1
Tartous	4.8	4.9	5.0
Lattakia	6.2	6.3	6.4
Idleb	6.1	6.0	6.3
Aleppo	20.9	20.3	20.8
Al-Rakka	3.9	3.7	3.9
Deir-ez-zor	4.6	4.9	4.4
Al-Hasakeh	7.4	7.3	7.0
Dar'a	3.7	3.8	3.6
Sweida	2.2	2.0	2.0
Quneitra	0.2	0.3	0.3

## 7. Migration

Of the two major net components of population growth, migration and natural increase, migration is by far the most difficult to measure and explain. Birth and death are events which can be easily defined, and they happen only once each in a lifetime. As such, they are biological phenomena whose rates are subject to social, economic and cultural influence. For migration, however, even a definition is subject to ambiguity and cultural differences. Furthermore, the source of causation for migration is virtually always in the social environment with little connection to biological processes.

Because of these factors, it is especially important to the study of migration to have data which employ a definition of migration which has been carefully considered, and which is subsequently applied universally throughout various statistical reporting services. As Annendix I shows, Syria has not given enough attention to the definition of migration which is currently in use. This is probably a result (or perhaps a cause) of a lack of analysis of migratory flow data which would help researchers recognize limitations in current data.

### 7.1 Migration Flows

The present analysis of migration flows assumes that, with certain transient and relatively unimportant exceptions, migration results from regional inequalities in opportunities which the members of a population define as important. Opportunities may or may not mean economic opportunities and in general an individual's definition of an important opportunity is influenced by individual factors, as well as structural characteristics of the social systems involved, and an individual's position in a social system. In general, the greater the discrepancy in two regions' levels of opportunities, the more unidirectional will be the flow. That is, there will be a large flow in one direction with a relatively small counterstream. Overall, flows will be largest to the places with the greatest opportunities.

The nature of opportunities which are defined as important are not easily revealed using Syrian data. As yet, Syria has not placed an emphasis on individual level analyses of migration and we can only hope to gain some general ideas about these factors using the following relatively indirect means.

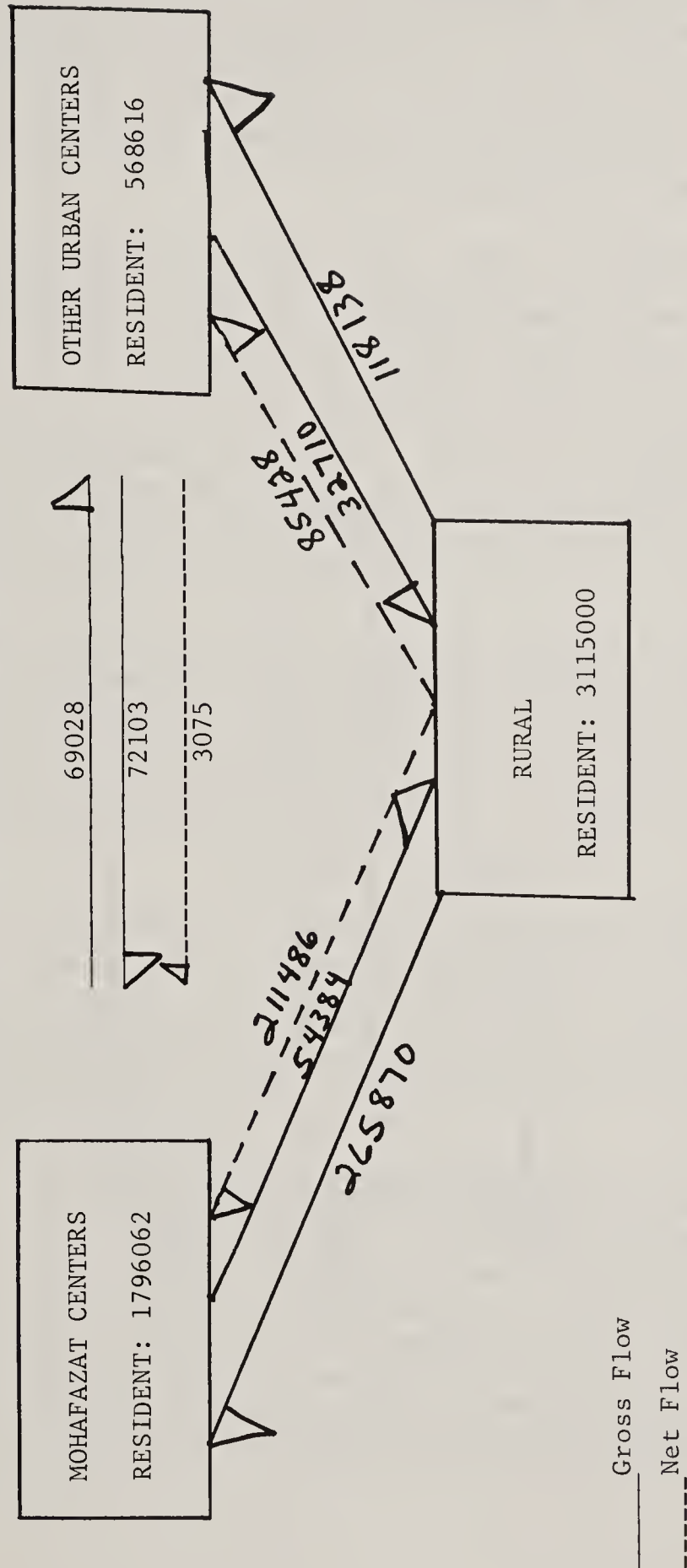
Figure 9 presents a schematic diagram of flows between the major data sectors using data from the 1970 Census of Population. We really have no idea when the flows took place, but we can see the general patterns of urbanization during the preceeding years. Figure 9 shows the gross flows between pairs of sectors as well as the net flow and directions. The resident population cited within each box refers to those who had no previous residence either in another sector, or within the same sector but in a different Mohafaza.

The magnitude of the flows suggests two entirely different types of migration taking place between Mohafaza Centers, other urban centers, and rural areas. We see first, highly directional migration between rural and both types of urban sectors. That is, the rural to Mohafaza Center flow, and rural to other urban centers flow are considerably larger than the counterstreams. In terms of opportunities, we would surmise the greatest differentials to be between Mohafaza Centers and rural areas with somewhat less difference between rural and other urban centers. More elaborately,



FIGURE 9

SCHEMATIC REPRESENTATION OF FLOWS PRIOR TO  
1970 BETWEEN THE MAJOR SECTORS



we need to invoke the concept of migration inefficiency. Migration is inefficient when there are large flows in both directions resulting in little net change. The most efficient stream is that from rural areas to Mohafazat Centers. A total of 320,254 persons were involved with a net flow of 211,486 for an average of 1.51 persons moved per net change of one person in population distribution ( $320,254 / 211,486 = 1.51$ ). Between other urban centers and rural areas a total of 150,848 persons moved in either direction with a net gain of 85,428 for an average of 1.77 persons moved per person net change in distribution.

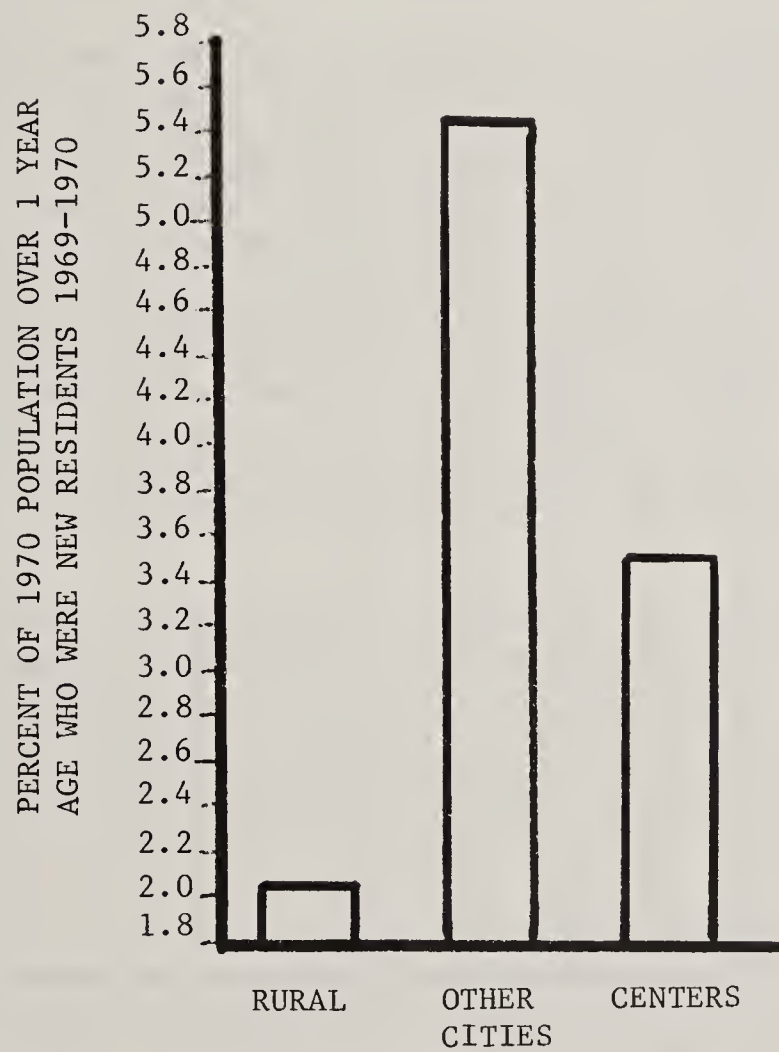
In contrast to these clear examples of urbanization process flows, we find that an entirely different type of migration exchange has taken place between Mohafazat Centers and other urban centers. We find sizeable gross flows in each direction with a net change of only a small number of persons. The value of the index of migration inefficiency is quite high--about 45.9 total persons moved for a net change of one person. Such flows generally reflect two possible circumstances: (1) relatively random movements, or (2) opportunities in each place which are different, and appeal to entirely different persons such that the characteristics of the flows in opposite directions are quite different, but the net changes remain small.

Overall, we find that about 15.8 percent of the total population of Mohafazat Centers were immigrants at some time prior to 1970 and came primarily from rural areas. Because of the large flows between centers of Mohafazat and other urban centers, we find that in 1970 nearly a quarter of the population in other urban centers were new residents. Finally, due to the large net out-flows, only about 2.7 percent of the 1970 rural population were new residents having moved in at some previous time.

In Figure 10, I have calculated a somewhat more refined rate of immigration for the three sectors. I have computed an approximate annual rate of immigration by taking new residents with a duration of residence of less than one year as a function of the total 1970 population over one year of age. Technically, this is an immigration ratio since it provides no basis for assessing a probability of moving. It does, however, indicate rapidity of immigration.

In Figure 10, we find that it is urban centers which, on a ratio basis, are most composed of the newest residents. From Figure 9, the reason should be clear. The large gross flows between Mohafazat Centers and other urban centers result in an urban center population which is proportionally unstable in the sense that many of the current residents are not long term residents since return flows from urban areas are relatively small. But we should note particularly that in Figure 10 we find about 2.1 percent having immigrated in less than a year prior to 1970. In Figure 9, which represents all prior migration, we found only about 2.7 percent

FIGURE 10: ANNUAL RATE OF INMIGRATION, 1969-1970



inmigration. Thus, we may surmise that the urban to rural flow has been concentrated in the previous year. This suggests a trend toward a larger counterstream to rural areas. Available data do not tell us anything about this interesting trend and we cannot know if these are first time migrants, or people return-migrating.

That migration is selective of certain types of persons means that the characteristics of the populations of sending and receiving areas are constantly altered by migration. The most commonly cited selection factors are age and sex. Syria evidences the relatively traditional patterns of selectivity though not to any unusual extent. Migration is somewhat selective of young adults and males. Relevant data from the 1970 Census of Population are presented in Figures 11 and 12 for migrants, 1960-70, the rest of the population, and for the three major sectors we have been considering.

From Figure 11 we see that migration patterns have most severely affected the rural areas. Since migration tends to be selective of those at ages 15-39, we find the lowest proportions at these ages among the continuous residents of rural areas. My own observations in the field have confirmed these data in that I have witnessed seemingly unusual proportions of elderly and young children in villages with relatively few young adults. We know from earlier data that migrants enumerated in Mohafazat Centers tend to be from rural areas. And we see in this figure that nearly one-half of migrants enumerated in Mohafazat Centers are between the ages of 15 and 39. Thus, the most extreme selectivity by age is in the rural to urban flow. Continued over a long period of time, this pattern will contribute to a severe dependency problem, and labor shortages in rural areas.

A similar picture is evidenced in Figure 12 with respect to sex structure. The rural to urban flow is seemingly the most male dominant, leaving a female excess in rural areas as indicated by the differential in percent male for the rural residents, and migrants enumerated in Mohafazat Centers especially, but also those ending up in other urban centers. However, the rural to urban flow contains many women and, we must assume, many families.

## 7.2 Patterns of Migration by Mohafaza

Data from the 1970 Census of Population, published in the 1978 Statistical Abstract, provide the basis for an approximate flow analysis for Mohafazat in Syria. A matrix by Mohafaza has been published for flows prior to 1970. Again, however, we must remember that these data are not fixed in time and a migrant may have moved into his or her current residence at any time prior to 1970. The data are, however, of some value in showing the general patterns which had been underway until 1970.

FIGURE 11

PERCENT 15-39 MIGRANTS 1969-70 AND REST OF POPULATION, 1970  
(PERSONS OVER 1 YEAR AGE)

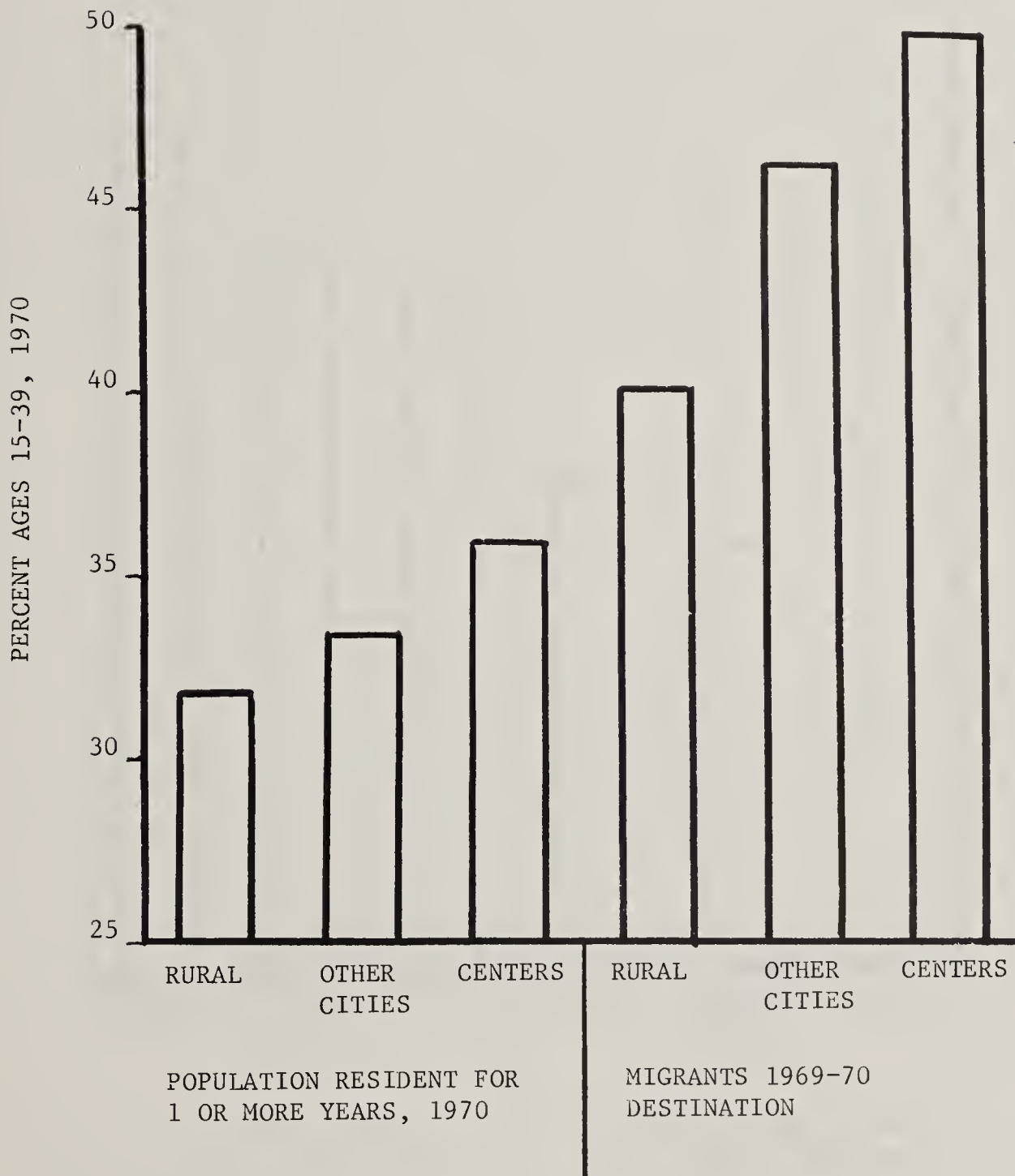
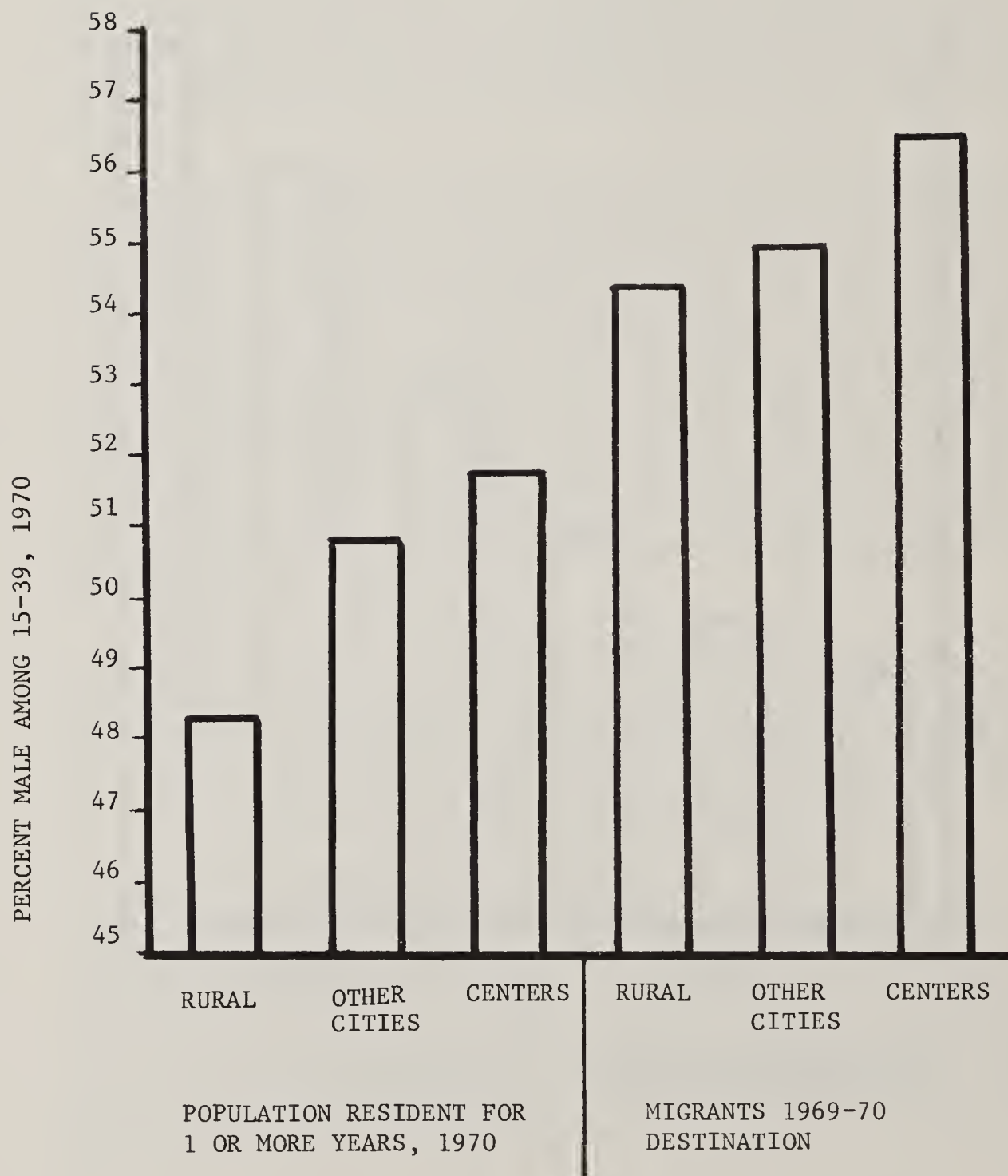




FIGURE 12

PERCENT MALE AMONG THOSE AGED 15-39,  
MIGRANTS AND REST OF POPULATION, 1970



The original published matrix is a 14 by 14 array, at the Mohafaza level, of current by previous place of residence. Since we are only interested in migration flows, and not continuous residence, I deleted the diagonal of the matrix and have worked with data on flows between all possible pairs of places. My analysis is based on the concept of migration efficiency. The three matrices derived from the published data are presented in the following pages.

As an example for the use of these data, let us look first at the 1st entry of the first row of figures in the total flow matrix (see Figure 13). That figure, 70441, is the total movement in both directions between Damascus City and Damascus Mohafaza. The original published data indicated 27119 persons enumerated in Damascus City with previous residence in Damascus, and 43322 persons enumerated in Damascus but previously having resided in Damascus City. The net figure, in the second matrix (see Figure 14), is thus -16203 or a loss from Damascus City to Damascus. Care needs to be taken in reading the signs of the net figures in Figure 14. The referent location is given on the left. To read the net flows for Tartous, for instance, one reads across and then up. The meanings of the signs reverse when one changes from reading across to reading up. Thus, Tartous gained 365 from Quneitra, but lost 90 to Dar'a, and gained 9 from Sweida, lost 184 to Al-Rakka, and so forth.

Finally, the indices of migration inefficiency are presented in the third matrix (see Figure 15). The figures represent the number of persons who have moved between two places to result in a net change of one person. That is, it is total migration divided by the absolute value of net migration.

All of this information may be of importance, depending upon one's purposes. Net flows, of course, are important to the regional shifts in population growth which have taken place in Syria. But, a given net change may be accomplished by a wide range of component flow magnitudes. Furthermore, regardless of net change, the total flow and original component flow data indicate the extent to which two populations tend to be composed of recent migrants. Though such an extreme case has not taken place in Syria, it is possible for two regions to contain populations which are 100 percent composed of migrants, but neither of which experienced net migrational growth. This would happen if every person in area A moved to area B at the same time everyone in area B was moving to area A. Even without net change, both regions would have experienced the social disorganization which attends very highly mobile populations.

REFERENT  
LOCATION, 1970

FIGURE 13: TOTAL FLOW MATRIX

	QUE	TART	DARA	SWE	RAK	HAS	IDL	DEZ	LAT	HAMA	HOMS	ALEP	DAMA
DAM-C	46503	8500	17720	11082	1311	4522	6680	6188	17613	17159	22746	20978	70441
DAMA	35140	2059	9761	7385	466	851	2027	1343	5502	4006	6639	4598	
ALEP	578	2197	924	963	38092	13657	27673	6728	7307	4637	5816		
HOMS	2771	5579	1616	1079	1561	2454	1819	1642	4085	16309			
HAMA	632	3282	646	422	1645	2515	7837	862	3680				
LAT	1148	7098	1321	1008	832	1102	6856	790					
DEZ	297	335	328	326	5966	8171	1282						
IDLEB	162	640	423	277	5502	2760							
HAS	179	760	611	577	2047								
RAK	109	548	478	333									
SWE	845	331	1614										
DARA	18138	386											
TART	365												

FIGURE 14: NET FLOW MATRIX

REFERENT LOCATION	QUE	TART	DARA	SWE	RAK	HAS	IDL	DEZ	LAT	HAMA	HOMS	ALEP	DAMA
DAM-C	46467	4452	14884	3696	-53	2596	4472	4542	8641	10959	8310	8144	-16203
DAMA	25040	905	7853	4031	040	149	1415	805	2082	1736	1885	2571	
ALEP	578	147	-178	045	-30984	-1141	10991	-2108	-635	1261	-302		
HOMS	2763	433	440	105	-963	116	781	678	371	4609			
HAMA	630	-412	-18	-16	-967	-677	4305	30	788				
LAT	1128	-396	-215	-128	-196	170	3214	268					
DEZ	297	-119	-134	-64	-4598	-4543	406						
IDLEB	162	-246	-207	-103	-4470	-1364							
HAS	179	-334	63	-205	-403								
RAK	109	184	322	107									
SWE	799	-9	412										
DARA	18054	90											
TART	365												
QUE													

FIGURE 15:  
INDEX OF MIGRATION INEFFICIENCY<sup>1</sup>.

	QUE	TART	DARA	SWE	RAK	HAS	IDL	DEZ	LAT	HAMA	HOMS	ALEP	DAMA
DAM-C	1.00*	1.91*	1.19*	3.00*	24.74***	1.74*	1.49*	1.36*	2.04*	1.57*	2.74*	2.58*	4.35**
DAMA	1.00*	2.28*	1.24*	1.83*	11.65***	5.71**	1.43*	1.67*	2.64*	2.31*	3.52**	1.78*	
ALEP	1.00*	14.95***	5.19**	21.40***	1.23*	11.97***	2.52*	3.19**	11.51***	3.68**	19.26***		
HOMS	1.00*	12.88***	3.67**	10.28***	1.62*	21.16***	2.33*	2.42*	11.01***	3.54**			
HAMA	1.00*	7.97**	35.89***	26.38***	1.70*	3.71**	1.82*	28.73***	4.67**				
LAT	1.02*	17.92***	6.14**	7.88**	4.24**	6.84**	2.13*	2.95*					
IDLEB	1.00*	2.60*	2.04*	2.69*	1.23*	2.02*							
HAS	1.00*	2.28*	9.70**	2.81*	5.08**								
RAK	1.00*	2.98*	1.48*	3.11**									
SWE	1.06*	36.78***	3.92**										
DARA	1.00*	4.29**											
TART	1.00*												

1. Total Migration / Net Migration

\* = Efficient:  $MII \leq 3.00$   
 \*\* = Moderately Efficient:  $3.01 - 10.0$   
 \*\*\* = Inefficient:  $> 10.0$



Finally, the inefficiency indexes are keys to the types of migration flows involved. We should keep in mind that highly efficient (small index numbers) flows are the ones which will tend to result in net regional shifts and tend to result from regional inequalities in opportunities. In contrast, highly inefficient (large index numbers) flows tend to contribute greatly to the total volume of migration and to the total count of migrants in a population, but do not generally result in much net redistribution. Inefficient flows tend to signal relatively random exchange and little difference in overall levels of opportunities in places, or, high turnover such that one type of person is moving toward a particular opportunity while another type of person is moving in the opposite direction being attracted by different kind of opportunity.

From these data, we can infer opportunity differentials and overall levels of attractiveness of places. Clearly, overall, Damascus City is the opportunity center of Syria as indicated by the generally efficient, and sizeable, positive net flows. In contrast, Idleb appears to be the least attractive and most lacking in opportunities. Again, we tend to find a regular pattern of efficient flows but which are all out of Idleb in net population change. Quneitra had a transient migration flow and was not subject to usual principles.

We should note also that Damascus Mohafaza is an opportunity center which simultaneously is attracting people from relatively rural Mohafazat and suburban growth from Damascus City. Damascus may be in a unique position in Syria. It seems to be a destination for many migrants from all over Syria. Simultaneously, suburban growth is also contributing to Damascus Mohafaza as housing shortages and congestion force population spillover from Damascus City. It is highly likely that growth due to these two sources will continue in the future and overall growth in Damascus Mohafaza, especially urban centers, is assured. In short, Damascus City is spreading beyond its political boundaries and will continue this suburbanization process in the future.

For some planning purposes, absolute net flows may be more useful than more complex measures. Table 8 lists the major net population changes which took place in the years prior to 1970. These flows influence current regional population distribution.<sup>9</sup>

An indication of the overall effect of pre-1970 migration patterns on population change in each Mohafaza can be gained from an examination of net population change data. In the first matrix, we have two population totals for each area, one in 1970 and one which is the population at some earlier date after adding back in the out-migrants and taking out the immigrants. The net difference in these two figures is the overall growth or decline as a result of migration. We may express this as a percent of the previous population

TABLE 8:  
MAJOR NET REDISTRIBUTION PATTERNS PRIOR TO 1970  
(Net Flows of 4000 or More)

<u>FROM</u>	<u>TO</u>	<u>NET</u>	<u>TOTAL EXCHANGE</u>	<u>INDEX OF MIGRATION INEFFICIENCY</u>
Quneitra	Damascus City	46467	21767	1.00
Quneitra	Damascus	35040	35140	1.00
Aleppo	Rakka	30984	38092	1.23
Quneitra	Der'a	18054	18138	1.00
Damascus City	Damascus	16203	70441	4.35
Der'a	Damascus City	14884	17720	1.19
Idleb	Aleppo	10991	27673	2.52
Hama	Damascus City	10959	17159	1.57
Lattakia	Damascus City	8641	17613	2.04
Homs	Damascus City	8310	22746	2.74
Aleppo	Damascus City	8144	20978	2.58
Der'a	Damascus	7853	9761	1.24
Hama	Homs	4609	16309	3.54
Deir-ez-Zor	Rakka	4598	5966	1.30
Deir-ez-Zor	Hassakeh	4543	8171	1.80
Deir-ez-Zor	Damascus City	4542	6188	1.36
Idleb	Damascus City	4472	6680	1.49
Idleb	Rakka	4470	5502	1.23
Tartous	Damascus City	4452	8500	1.91
Idleb	Hama	4305	7837	1.82
Sweida	Damascus	4031	7385	1.83

in order to approximate a rate of migrational population growth. Again, however, we must keep in mind that this is not a true rate since we have no idea of when the previous population was at its indicated value. Thus, while we can't truly assess the timing of the flows involved, we can gauge the relative importance of migration to total population growth in each of the Mohafazat. The figures are from the 1970 matrix and are presented in Table 9.<sup>10</sup>

While Damascus City has grown the most in absolute terms, proportional migrational growth has clearly been the greatest in Al-Rakka near the Euphrates Dam Project. We also clearly see the role being played by Damascus Mohafaza. Its growth due to migration has been nearly as large, proportionally, as that which has taken place in Damascus City.

Aside from Quneitra, Idleb shows the greatest proportional losses due to the pre-1970 migration patterns. Aleppo, however, has lost the greatest absolute number of persons, ignoring Quneitra. Finally, it is significant to note that only four Mohafazat have served as provinces of net migrational growth. They are Damascus City, Damascus, Al-Hasakeh and Al-Rakka. The rest have experienced net out-migration.

In an effort to identify migration selection with respect to education, I have performed an analysis of 1976 counts of migrants, by education, for six relatively rapid migration growth urban territories. In order to accomplish this analysis, I have used 1976 Sample Census data on sampled migrants, by education, sex, rural or urban residence and Mohafaza published by the Central Bureau of Statistics. The published figures for migrants are sample counts. For the population total used for comparison, published counts were used. I have first calculated the educational distribution by sex and Mohafaza, of migrants estimated in the urban sector. This distribution for migrants can be compared to the percent distribution for the total population to discover selection bias. As before, we have no idea when these migrants immigrated and so cannot assess the timing of flows. But we can see what types of persons tend to be migrants, educationally, and can assess how migration is changing the educational compositions of these six major urban sectors receiving the migrants. Data are presented in Table 10 for those Mohafazat with urban growth, 1970-76, of greater than four percent per year.<sup>11</sup>

The data reveal some clear and interesting patterns. Most striking are the unusually high concentrations of illiterates among migrants. This is especially the case among females. In Damascus City, and other urban places in Tartous, Lattakia, Aleppo, and Dar'a, proportions of females who are illiterate are substantially higher among immigrants than the overall level of illiteracy in the population. For males, a similar situation is evident primarily for Aleppo. In short, we can infer that rural to urban migration patterns for females are profoundly contributing to urban illiteracy levels in several of these urban areas.

TABLE 9: NET MIGRATION CHANGE BY MOHAFAZA

	Population Previous	1970	Net Migration Change	Net Migration as a Percent of Previous
Damascus City	687527	788434	100907	14.7
Damascus	520987	595622	74635	14.3
Aleppo	1324675	1291618	-33057	-2.5
Homs	521820	521260	-560	-0.0
Hama	502545	487643	-14902	-3.0
Lattakia	390161	382759	-7402	-1.9
Deir-ez-zor	302653	289683	-12970	-4.3
Idleb	410306	378494	-31812	-7.8
Al-Hasakeh	452414	456408	3994	0.9
Al-Rakka	197098	240494	43396	22.0
Sweida	131664	125188	-6476	-4.9
Dar'a	229324	224472	-4852	-2.1
Tartous	298123	293793	-4330	-1.5
Quneitra	122937	16366	-106571	-86.7



TABLE 10:  
EDUCATIONAL DISTRIBUTIONS OF MIGRANTS AND TOTAL  
POPULATIONS OF SELECTED URBAN AREAS OF MOHAFAZAT, 1976

	Education Level (%)				
	Illiterate	Semi-literate	Primary	Intermediate	Higher
<u>Damascus City</u>					
Male Migrants	13	25	26	12	24
Male Population	11	32	28	12	17
Female Migrants	43	20	18	9	10
Female Population	29	28	23	11	9
<u>Tartous</u>					
Male Migrants	12	27	27	14	20
Male Population	11	29	28	13	19
Female Migrants	34	23	20	11	12
Female Population	28	26	21	12	12
<u>Lattakia</u>					
Male Migrants	11	27	27	14	21
Male Population	14	29	28	13	16
Female Migrants	46	17	18	9	10
Female Population	35	23	22	12	8
<u>Aleppo</u>					
Male Migrants	33	32	15	8	12
Male Population	24	38	19	9	11
Female Migrants	72	12	7	4	5
Female Population	52	23	13	7	6
<u>Rakka</u>					
Male Migrants	23	31	27	10	9
Male Population	25	33	26	8	7
Female Migrants	60	17	15	5	3
Female Population	62	18	14	4	2
<u>Der'a</u>					
Male Migrants	11	27	27	10	25
Male Population	11	38	27	13	11
Female Migrants	53	19	14	7	7
Female Population	42	27	19	8	4



## 8. Concluding Remarks

Urbanization is a massive process underway in virtually all developing countries of the world. Its causes are various, but most important are the tremendous rural-urban differentials in levels of living and, in general, diversity of opportunities. Such differentials are apparent in Syria. Furthermore, urbanization is fueled by rapid rural natural increase, as well as high rates of natural increase in urban areas. Unfortunately, despite a variety of attempts, most efforts to stem rural to urban migration have failed. In some cases, this has resulted from a failure to recognize that migration is not caused simply by employment-related opportunities. Decentralizing employment may result in a huge capital investment only to discover that given a choice, workers will still choose to face the urban competition since they perceive the benefits of urban life to outweigh the disadvantages of perhaps underemployment or marginal rural wages. A primary survey of mobility intentions and factors could prove enlightening in Syria as a basis for estimating the potential success of a program of employment decentralization.

A more encompassing, and perhaps more expensive, program of equalization of standards of living and access to urban amenities is most likely to stem the rural to urban flows. Such a program simply causes the appeal of urban areas to be less encompassing and pervasive. Again, however, we have little information at the appropriate level of analysis (primary individual-level survey) on what the migrants perceive to be the important factors in urban immigration.

From the other point of view, we know little about outmigration factors in the rural areas other than general observations about areas which lack services such as telephones, running water or electricity. At the current time, it would appear that rural outmigration is more than simple movement of the excess rural levels of natural increase. There is a potential in rural areas for much more massive outmigration. Any program which seeks to unify farm production units with declines in labor-to-land ratios could result in a further impetus to rural outmigration. In short, rural outmigration could proceed more rapidly than it is at the current time, and planning must be made for absorbing not only current farmers who may leave the business, but also the farmers' sons and daughters destined to end up in urban areas.

Perhaps most importantly, I would suggest that high levels of rural to urban migration be assumed for the future. This leads to two needed areas of effort in Syria. First, urban areas need to be planned so as to accept these new residents--new housing, employment opportunities, social services, education, health services and so forth. At the same time, education and skills training in rural

areas can prepare the future rural to urban migrants to be productive contributors to future Syrian urban society.

## 9. Summary of Major Findings

9.1 For purposes of demographic analysis, Syria is only beginning to acquire needed information on only the most basic indicators--birth and death rates. The National Demographic Follow-up Survey is crucial in meeting this need.

9.2 Little concern has been given to the quantification of migration, internal and external, and as a result little is known about this factor.

9.3 Syria is currently experiencing extremely rapid population growth through natural increase of between 3.5 and 4.0 percent annually. This is due to a recent decline in death rates, probably infant mortality, and no declines in fertility.

9.4 Rapid growth through natural increase will continue for some time, probably for at least a decade. Rather conservative estimates of projected future growth (CBS-February) suggest a population of 8,979,000 in 1980 and 17,085,000 in 2000. This projection is based on an assumed fertility decline which is overly optimistic and will be corrected in new projections to be prepared.

9.5 Under the above mentioned projections, the dependency ratio will decline from about 55 percent in 1970 to 44 percent in 2000.

9.6 At 1970 employment rates, the projected growth will require more than double the 1970 employment opportunities by 1990. In 1970, there were 1,429,000 employed persons and the projections by age suggest 3,160,000 employed persons in 1990 to maintain 1970 rates. This is probably also an underestimation.

9.7 The age structure of the employed labor force in 1990 will be more concentrated at ages 15-39 than it was in 1970.

9.8 There are sizable rural and urban differences in the components of natural increase. The crude death rate is about 7.5 in urban areas and 9.5 in rural areas. The infant mortality rate is estimated at about 58.0 in urban areas and 71.7 in rural areas. The urban crude birth rate is about 41.0 and the rural crude birth rate is about 49.5. The total fertility rates are 6.1 children in urban areas and 8.8 children in rural areas.

9.9 The rural-urban fertility differential is not entirely due to environmental or cultural differences, but can to a great extent be explained by differences in the composition (age and education particularly) of the female populations in the two sectors.

9.10 The levels of illiteracy, a key link to fertility differentials, are shocking, with nearly 85 percent of rural women ages 15-49 illiterate, and 41 percent illiterate in urban areas.

9.11 Sizeable flows of illiterate women in the rural to urban migration patterns may be contributing significantly to urban fertility levels.

9.12 There is conflicting evidence regarding the magnitude of net migration into or out of the country. The best guess at this time, pending new data sources, is that there are sizable flows into and out of the country but little net gain or loss.

9.13 Rural to urban migration is focused not solely on Mohafazat Centers, but is spread between such very large cities and the smaller urban centers.

9.14 On a proportional basis, other urban centers than Mohafazat Centers are most composed of recent migrants (as of 1970).

9.15 Past migration patterns have been fairly typical in age and sex selectivity, leaving excesses of children and older persons, and to a lesser extent females in rural areas.

9.16 In terms of absolute numbers, Damascus City is clearly, the opportunity center for migrants from other areas of the country.

9.17 However, we should note that Damascus Mohafaza is rapidly growing due to spillover from Damascus City growth.

9.18 Major areas of net migration loss on a proportional basis are Idleb, Deir-ez-zor and Sweida.

9.19 Rural to urban migration is not near the theoretically high maximum possible rate and could accelerate in the future.

## 10. Recommendations

10.1 It should be recognized that demographic analysis of sufficiently useful quality for decision-making is an on-going process involving both description and more demanding explanatory analysis requiring highly trained persons. There currently exists an acute shortage of trained demographers in Syria, a situation which requires that people who could do specialized analysis must spend much time on simply "getting the data out." This is a serious problem contributing to poor morale and a "brain drain."

10.2 More care should be given to how migration is defined in the census schedule and, perhaps, that the migration question be changed to enumerate place of residence five years earlier so as to make the data time-specific.



10.3 Prior to preparation of the 1980 census tabulations, there should be a working conference involving experts from interested Ministries and Agencies, outside experts for the purpose of planning how the 1980 census migration information should be analyzed and reported. This conference should establish information priorities, and the specific tabulations which will meet those information needs.

10.4 After the 1970 census, there will be the need for more information on the process of migration which cannot be met with census data. I would like to see Syria undertake a research program in migration similar to that of the current Follow-up Survey. The proposed program, which could follow-up from the census, should be a longitudinal study of a random sample of sufficient size to allow subsequent long term re-interviews of persons who migrate. This would allow analysts to chart movements and gain insight into the process of migration, especially from rural to urban areas. The purpose here would not be to provide rates and total counts, but rather to gain information on who moves, where, why, how, and how often.

10.5 In the context of planning for future urbanization, it is most important to prepare urban areas to be able to accept new residents, and to prepare young and old alike in rural areas to be contributors to an urbanized society to which they will probably move or eventually come to be surrounded by. For rural areas, this basically means training.

10.6 The preparation of population projections is an on-going process which involves refinement in the light of new information. There should be no overt or covert restrictions which impede this process and users of projections should be fully aware that one series may only be valid for a few months, or even weeks.

10.7 The certain future high rates of growth are primarily due to fertility levels. Yet, there is virtually no recent trend data from which to analyze the true causes of high or low fertility in Syria and from which to make predictions. Analysis is needed to ascertain how education is linked to fertility in Syria--is it through the use of contraception, delayed marriage, or what? This is an important area for a research program.

10.8 Given the very high fertility levels, and little evidence for an impending decline, it would be wise to review, again, the possibilities of an active program to make family planning available to all, to be used on a strictly voluntary basis by those desiring smaller families. The key to such a program in Syria would seem to be one of subtle official acceptance which requires less governmental involvement than active endorsement. That is, I recommend a policy of allowing couples free choice and making that choice available and acceptable.

10.9 That concerted efforts be directed to bringing the standards of living in rural areas up to the levels of those in urban areas to provide a rural non-farm alternative to rural farm out-migrants.



Sources  
(Listed in Order of Text Appearance)

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- Note 1: Expectations of Life from U.N. Model Life Tables used in Syrian CBS projections and provided, via Xerox, by Mr. Dibis at the CBS.
- Fig. 2: Data provided in conversation with Mrs. Hanbeley, and in Xerox form, and are from the National Follow-up Survey, 1976.
- Note 2: TFR declines as forecast provided by Mr. Dibis of CBS. Age-specific birth rates and average age at childbearing and sex ratio at birth provided by Mrs. Hanbeley and are results of the Follow-up Survey.
- Note 3: Forecasts provided in Xerox form by Mr. Dibis at the CBS. The full age and sex schedule is now readily available from the CBS.
- Fig. 3: Calculated from the CBS National Projections and the 1970 Census of Population age schedule as it was published in the 1978 Statistical Abstract.
- Note 4: Employment rates calculated from 1970 Census of Population, Vol. 1, Table 49.
- Fig. 4: 1970 calculated from 1970 Census of Population, Vol. 1, Table 49; 1990 calculated from CBS National Projections.
- Note 5: Reprinted from Allan G. Hill, "The Impact of Socio-Economic Factors on Fertility and an Analytical Framework for Predicting Fertility Trends with Reference to Syria." Presented, September 1978 at a Seminar on Factors of Population Growth and its Future Trends.
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- Fig. 5: Percent urban from 1970 Census of Population. Mortality data from Nabil F. Khoury, "Inter-relationship Between Urbanization and Socio-Economic Changes: The Case of Syria.", Presented, 1978, at the Seminar on Factors of Population Growth and its Future Trends.

Note 7: Fertility data from National Follow-up Survey and provided in Xerox form by Mrs. Hanbeley.

Fig. 7: From Follow-up Survey, first and second year results.

Fig. 8: Provided in Xerox form by Mrs. Hanbeley and from the National Follow-up Survey, first and second year results.

Note 8: 1970 and 1976 data available in CBS publication 349/1/221-77, "Certain Demographic Indicators.", results of Population Census by Sample, 1976, First Phase.

Fig. 9: Migration data from 1970 Census of Population, Vol. 1, Table 16.

Fig. 10: Calculated from 1970 Census of Population, Vol. 1, Table 17.

Fig. 11: Calculated from 1970 Census of Population, Vol. 1, Table 17.

Fig. 12: Calculated from 1970 Census of Population, Vol. 1, Table 17.

Matrix

Data: Calculated from 1970 Census of Population data as published in the 1978 Statistical Abstract, Table 9/2, pp. 92-93.

Note 9: Calculated from matrix data cited above.

Note 10: Calculated from matrix data cited above.

Note 11: Obtained from 1976 Census by Sample publication, by Mohafaza, Table 12. Population data from 1976 Census by Sample, Publication for Total Population, Table 15.

APPENDIX I:

Migration Analysis, the 1970 and 1976  
Censuses and the 1980 Census Methodology

The analysis of migration requires that migration be defined in time as well as space. Migration data reported in the Syrian censuses of 1970 and 1976 are appropriately fixed in space (geographically) but not in time. That is, a migrant is defined as one who changed permanent residence categories of Mohafaza center, other cities, or rural either within or across Mohafazat at any previous time. I have suggested in my conversations that this system may be improved by defining a migrant spatially, completely in geographical terms, such as movement across Nahia boundaries.

More important to analysis, however, is the fact that as currently defined, a migrant may have changed permanent residence at any time earlier in his or her life. Tabulations published by the Central Bureau of Statistics present information on duration of residence and place of previous residence separately and thus it is not possible to construct annual or five-year rates of migration for flows between areas.

I have suggested to various persons two possible courses of action to remedy this problem. The first is a retabulation of the 1976 sample census results such that a table of current by previous place of residence is presented for only those who have a duration of residence of less than five years and who are at least five years of age. In combination with a matrix which includes nonmigrants, we can construct the initial population five years earlier and compute true rates of outmigration from various sectors. However, since the questions used only get the last residence, there is a potential error in assuming time and location of residence at some specific prior date. For planning purposes, and descriptive use, a snapshot of population distribution at mid-decade is especially useful.

This snapshot is obtained through adoption of my second suggestion for migration analysis. Beginning with the 1980 census, the previous residence question could be changed to enumerate place of residence on a fixed prior date, such as one or five years earlier. Numerous experiments have suggested that five years is the maximum over which people are accurately able, in general, to remember their residence histories. With this form of question, and taking only those alive during the entire interval (persons over 5 years of age), it is possible to construct a migration matrix which is closed to births and deaths and which provides a good basis for the analysis of regional shifts in population in terms of origins and destinations.

A census should first and foremost, with regard to migration, provide analysts with information on migratory flows over a fixed period of time so as to chart regional patterns both in terms of absolute numbers, and also in terms of time-specific rates. This is a first priority given limited resources. At a second level, primary surveys should not be used to obtain rate parameters, but instead should concentrate on more detailed information such as characteristics of migrants, behavioral factors and motivations. Those planning studies must keep in mind that migration involves two distinctly different units of analysis and a study should decide which of the two is the focus from the outset. The two units of analysis are moves, and migrants.

In all countries, it is the case that a majority of all moves made over a period of time are made by a minority of persons. This is because people can move more than once in a period of time, and because those who have moved once in their lifetime tend to be repeat movers. A count of persons who have moved, then, will understate the number of moves over a fixed period of time when migration is defined in certain ways. In spite of this problem, an undercount of total moves is probably less serious than not being able to know rates of place-to-place migration which have occurred during some period of time. The latter information is extremely difficult to obtain given current Syrian census techniques. On the other hand, the Syrian census does obtain a count of persons who have changed residence, once, and enumerates their last residence and duration of current residence.

The approach suggested earlier would tend to undercount moves, but would provide information to allow multiregional population counting which is most valuable to planners. That suggested approach requires a slightly different census question than is currently used. It requires obtaining the place of residence on a fixed prior date. The United States, for example, enumerates residence as of the census date five years prior to the census. Tabulations are then presented, for flow analysis purposes, only for those over five years of age, since technically a child born in the previous five years is an "entrant" to a region's population by birth most importantly. This avoids the problem of what to do with children who are born into an accounting system but who also migrate. In this form, data may be arrayed in a matrix with special properties which have proven quite valuable. The following matrix is a hypothetical example for illustration purposes.

The table contains the total population which was alive during the entire interval; that is, it excludes those who were born during the last half of the decade, and of course does not include deaths since such persons were not available for enumeration at the census date. The grand total, P, then would match the population five years ago



Illustrative 5-Year Matrix of Migration

		Region of Residence 5 Years Ago				
		I	J	K	L	TOTALS
Region of Residence at Time of Census	I	II	IJ	IK	IL	A
	J	JI	JJ	JK	JL	B
	K	KI	KJ	KK	KL	C
	L	LI	LJ	LK	LL	D
TOTALS:		E	F	G	H	P

with deaths added back into the figures. The individual cells of the table denote place-to-place flows of migrants, as well as non-migrants. The latter are in cells II, JJ, KK, and LL. Cell IJ, for instance, is a count of persons moving from J to I. The reverse flow is JI, those who were in I five years earlier but in J at the time of the census. Totals A through D are "current" populations and E through H are the prior populations of the regions. The net change in a region's population is, for instance for region I,  $A - E$ , and so forth.

The matrix allows for two important types of migration studies. We can study place-to-place flows, (IJ, LK, KL, JI, etc.), and we can study gross flows. The gross outmigration from I is total E minus all II. Similarly, the gross immigration to I is total A minus II. In short, we have an extremely flexible accounting system which can meet a variety of needs.

The Central Bureau of Statistics has published a similar matrix but with a fundamental flaw in both 1970 and 1976 sources. The data are for migrants whose last move was enumerated regardless of when that person resided in the previous place. Thus, the flows are not fixed in time and the totals corresponding to previous populations E through H in the example above refer to regional populations at no specific prior date.

I have, however, gone ahead with an analysis of Syrian migration flows using this form of matrix data, not because it is good data, but because it's better than nothing and probably does provide a fairly reliable indication of relative magnitudes of flows in the past.





Syria: Agricultural Sector Assessment

Volume 5: Human Resources and Agricultural Institutions Annex

CHAPTER II

AGRICULTURAL MANPOWER

by

Lester Schmid

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	3
Goals in Agricultural Manpower Planning in Syria	3
Methods of the Study	3
2. Labor Supply in Agriculture	5
Rural Population	5
Rural Labor Force	7
Farm Labor Force	8
3. Labor Requirements	13
Introduction	13
Labor Requirements for Crops	15
Required Skills of Farm Workers	19
4. Estimation of Underemployment and Worker Shortages	20
Monthly Labor Requirements Compared to Farm Labor Supply, by Mohafaza	20
Additional Evidence Concerning Underemployment --	
Farm Labor Shortages	23
Underemployment as Low Productivity	26
5. Potential Changes in Agricultural Manpower Availability	29
Projections of Recent Past Trends in Farm Manpower	29
Rural Population Change	30
Change in Farm Labor Force Characteristics	31
Economic Conditions	32
Government Policies	33

(Continued)

	<u>Page</u>
6. Potential Changes in Manpower Requirements	33
Mechanization	33
Farm Size	35
Individual Farm Organization	36
Land Area Availability Changes	36
Qualitative Changes in Farm Labor Force	38
7. Alternative Policies	39
Short-Range Policies	39
Labor-Saving Technologies	43
Labor-Intensive High-Value Production	46
Farm Subsidies	46
Nonfarm Employment, Particularly for Females	47
8. Research Needs Relating to Farm Labor	48
Farm-Holders Survey Data Analysis	49
Analysis of Nonfarm Rural Employment Possibilities	50
Analysis of Nonfarm, Agriculturally Related Employment	51
Share Rental System and Machinery Ownership	52
Labor Conditions	52
Appendix Tables	54

## 1. Introduction

The purpose of this study is to (1) discover what changes are taking place in regard to labor in farming, (2) identify what surpluses and/or shortages of labor there may be on a seasonal or regional basis, and (3) suggest possible policies to fulfill both immediate and long-run goals of the Syrian Government in regard to labor in agriculture.

### 1.1 Goals in Agricultural Manpower Planning in Syria

Some of the expressed goals of the Syrian Government as stated in the fourth Five Year Economic and Social Development Plan that are relevant to this study are: (1) to provide optimal full employment for the available manpower, to mobilize the rural manpower for the exploitation of idle agricultural resources, and to develop the countryside in general; (2) to achieve an optimal geographic distribution of projects among the various regions of the country so as to make available suitable work opportunities to rural manpower, to improve the rural living conditions, and provide rural populations with main services; (3) to effect an extensive survey of manpower in order to bring to light the extent of apparent, hidden, and partial unemployment; (4) to reconsider the distribution of excess manpower from sectors suffering from hidden and incomplete employment to sectors suffering from a shortage of manpower, as well as to transfer manpower from areas where it is in excess to areas suffering from a labor shortage; (5) to effect a survey of training needs in the country; and (6) to limit as much as possible the flow of internal migration to urban centers.

These goals, viewed in connection with Syria's past interest in land reform, would seem to indicate three major concerns toward which this study will be directed. These concerns are: (1) to maximize the production of farm products, food in particular, by making better use of existing physical and human resources; (2) to improve real incomes and living levels of people engaged in farming, both laborers and farmers; and (3) to simultaneously limit rural-to-urban migration.

### 1.2 Methods of the Study

The first part of the study is concerned with the supply of farm labor. Available census and labor survey materials are analyzed to present such information as could be surmised from somewhat contradictory data concerning the numbers of persons on farms and the characteristics of the farm labor force in regard to employment status, education, sex, and age.

The second part of the study is concerned with the requirements for labor. An attempt is made to take the surplus labor approach to the measurement problem of underemployment. In other words, an attempt is made to compare the numbers of workers with the amount

of work that needs to be done to produce the actual output. This can provide a basis for rough estimates, but the statistical requirements for the estimates of labor surplus having any claim to precision should not be understated.

An earlier investigation done by the author of the present study concerning the relationship between apparent labor requirements for major crops and livestock units in the United States indicated that the work done to produce the actual production would have occupied about half the time of the farm labor force working 40 hours per week. It is not very surprising that a greater proportion of the workers' time was not occupied by actual production time when one considers that: there is nonproductive work to be done in maintenance, etc.; there is time lost due to breakdowns and weather conditions; U.S. farmers earn as much off the farm as from farm earnings (the farm production cycle being seasonal). Therefore, as a point of departure I will postulate that if one could learn the labor requirements for all the crops and livestock enterprises in Syria, one could account for somewhat less than the apparent working time of the farm labor force. Besides the difficulties of defining the size of the farm working force in the first place, and the number of hours that each worker could be expected to work per week or per year, there is the other side of the equation which is at least as hard to estimate: that is, what are the labor requirements for the various crops themselves? There are many factors which contribute to a lack of precision in these estimates, such as the amount of mechanization for each of the production processes, the seriousness of the weed problems, whether or not the field is irrigated, and the type of irrigation and many other variables. Estimates will be made for each of the major crops in each Mohafaza with some allowances being made for livestock enterprises and minor crops.

There are at least two related, but somewhat different, concepts involved in this surplus or shortage of labor analysis. First, there is the static concept of determining the regions, seasons, and extent of surpluses and shortages at the present with current acreages of crops and livestock numbers. Second, there is the "Dynamic Concept," that is, what one can expect in the future as various factors change, such as farm size, farm practices (use of better seeds, weed control, etc.), and particularly mechanization. An attempt will be made to include both of these aspects in the analysis.

Also included are estimates of gross productivity per worker by Mohafaza. One must recognize that these are based on present prices and can change with prices. They can be used to measure differences in regions and over time but cannot be used to measure productivity in one sector of the economy as compared to another.

Included in the study are analyses of farm labor supply for the future and, closely related to it, the farm labor requirements for



the future. Finally, there is a discussion of alternative policies to attain the above expressed goals, and suggestions for further research that needs to be undertaken to better formulate policies to accomplish these goals.

## 2. Labor Supply in Agriculture

Analysis of the labor supply on farms will be presented in three parts: (1) data concerning the rural population; (2) data concerning the rural labor force; and (3) data concerning the farm labor force itself. There are two reasons for presenting some information concerning the rural population and rural labor force: first, to put the farm labor force into perspective; and second, to point to data gaps that make a more complete analysis impossible. The farm population is not likely to vary greatly from the rural population and the rural labor force in its characteristics, since it constitutes a large proportion of both.

### 2.1 Rural Population

For Syria as a whole, 56.5 percent of the population was considered rural in 1970. By 1976, this proportion had dropped slightly (54 percent). The Mohafazat of Sweida and Tartous had apparently experienced more rapid rural than urban growth in this period. Only the Mohafazat of Damascus and Aleppo were less than 50 percent rural in 1970, and were the only two that remained so in 1976. Al-Rakka, Dar'a, and Tartous were over 80 percent rural in 1970; the latter two remained above 80 percent in 1976. Homs and Al-Rakka both experienced decreases of over 10 percent in their rural percentages from 1970 to 1976 (see Appendix Tables 1 and 2).

The rural population increased only by 600,000 in six years, for an annual percentage growth rate of 2.62 percent as compared to 3.41 percent for the population as a whole. In spite of the fact that Syria's rural population grew more slowly than urban population during this time period, the absolute growth in rural population was still very large. The rural population of Al-Rakka showed the least percentage increase but was second only to Quneitra in absolute terms, a result consistent with the previously noted large drop in rural population as a percentage of total population in this Mohafaza. Increases in rural population over the six-year period ranged from 2.4 percent for Al-Rakka and 9.5 percent for Aleppo, to the relatively large proportional increases of about 25 percent for Tartous, Lattakia, and Idleb (see Appendix Table 3).

As shown in the population censuses, a disproportionate number of working age rural males have migrated from rural to urban areas. In order to obtain some indication of this trend, two comparisons were made: the rural and urban sex ratios were compared for 1970 and 1976; and comparisons of the rural proportion were made for each age group.

The sex ratio of the rural population as a whole was slightly less than that of the urban population--104 compared with 107. However, for both 1970 and 1976 the sex ratio for the rural population was less than 90 for the 25-40 age group, compared with over 100 for the same group in the urban population. For both years, the sex ratio for the rural age group 30-34 was about 81 (see Appendix Table 4).

In 1970, while the population as a whole was 56.6 percent rural and nearly as high for the male population as a whole, there were more males aged 25-34 living in urban than in rural areas. In 1976, the population on the whole was nearly 53 percent rural; again, there were more males aged 25-45 living in urban than in rural areas. Also for 1976, the proportion of females aged 20-24 who lived in rural areas was below 50 percent (see Appendix Table 5). Thus it appears that for both 1970 and 1976, a disproportionate number of the working age males had become urban. This is no indication, however, that the situation was much different in 1976 than in 1970. In total numbers, it was calculated that in 1970 the rural population would have been 62,000 greater if the number of persons in the working age groups had been identical to that in the total population; in 1976, the number would have been 79,000--a very small difference proportionate to the growth in total population.

It must be concluded that evidence from the 1970 Census and the 1976 Sample Census does not bear out the often heard contention that differential migration for the working age population increased from 1970 to 1976, though it may be correct in regard to what has happened since 1976. The number involved is insignificant compared to the entire population. But if one assumes that most members of this group are actively working (and therefore compare it to the number of persons farming), it is somewhat more significant--corresponding to about 13-14 percent of the farm work force.

Some information was obtained from the 1976 population sample census regarding internal migration. Since the data were unweighted, they cannot be taken as representative of the actual number of migrants. Rather, they are indicative of the direction of migration. About 38 percent of the migration from the rural areas was directly to the Mohafaza centers, about 50 percent to other Mohafaza centers. About 8 percent was to other urban centers; the remaining 4 percent was to urban centers in other Mohafazat, other than the Mohafaza center. As might be expected, most of the migration was to the two major urban centers, Aleppo and Damascus, with Aleppo being the destination of almost twice as many rural-to-urban migrants as Damascus (see Appendix Table 6). These data indicate that rural people migrate directly to the cities, since much of the migration to other Mohafaza centers was directly to Damascus and Aleppo.

Data concerning external migration are unavailable. In the Dar'a area, it was said that about 10 percent of the working age men in the rural areas are out of the country at any one time (working in the oil-producing Arab states). These men send money to their families and either return periodically for a short time or remain abroad for a number of years and return permanently. "Hearsay evidence" also indicates that it is common for rural, and also urban, men to migrate to Latin America and earn more than they are able to in Syria. The sex ratio for the ages 25-40 is lower than for other age groups for the combined urban and rural population, as can be inferred from Appendix Table 4. Differential external migration may be the cause (see James Williams's paper, "Population Growth and Migration in Syria," for more details).

## 2.2 Rural Labor Force

According to available evidence, the participation of the Syrian population in the labor force is lower than in most countries, particularly for females. For both males and females, the labor participation rate was below that of the less developed countries and above that of developed countries only for the age group 0-14. Participation by males in the labor force of Syria was apparently less than in both less developed and more developed countries, while for those over 55 participation was higher than in developed countries but less than in less developed countries. For females, the participation rate was over 20 percent in both less developed and more developed countries, but was only 5.3 percent in Syria, and much lower at all age groups above 14 (see Appendix Table 7). While the overall participation rate is partly a function of age structure, it is apparent that participation was also lower in Syria than in other countries for the most productive ages. This amounts to a possible deficit in Syria of 400,000 to 600,000 males and 660,000 to 800,000 females. In other words, if participation of Syrians in the work force were as high as in other countries, there would be from 1,000,000 to 1,400,000 more participants in the labor force. Perhaps this deficit may be due to different ways of measuring labor force participation, but this explanation does not account for the entire difference.

As one would expect, the labor force in Syria has grown during 1970-1976, but there have been apparent decreases in both 1973 and 1976 from the previous year. The rural labor force's proportion of the total labor force was also erratic, showing increases for 1973, 1975, and 1977--indicating some discrepancies in the data, particularly between the labor surveys and the population censuses (Appendix Table 8). This will be explained further in the section on farm labor (2.3).

In terms of labor force participation, there appears to be little difference in the rural and urban populations. The data for 1977 show a slightly higher participation rate by the rural population (as measured by the number in the work force divided by the



number of people over 10 years of age) (see Appendix Table 9). This appeared to be largely due to the greater participation by women in the rural labor force in 1977 as compared to the urban labor force.

Participation in the work force varied by Mohafazat in 1976, according to the Sample Census. Almost 73 percent of the rural males over 10 years of age were included in the work force in Al-Rakka, compared to only 55 percent in Tartous; female participation ranged from a low of less than 2 percent in Dar'a and Quneitra to over 10 percent in Homs and Lattakia and about 16 percent in Hama. These differences are quite large and do not appear to be a result of the degree of urbanization. Though the three Mohafazat which are highest in labor force participation are relatively rural, they are followed by the rates of the two most urban Mohafazat, Damascus and Aleppo (see Appendix Table 10).

### 2.3 Farm Labor Force

The farm labor force is evaluated according to its size and characteristics.

2.3.1 Size: According to the available data from the Census of 1970, the Sample Census of 1976, and the Labor Force Sample Surveys in 1971-75 and 1977, the number of farm workers varied greatly from year to year. The largest differences appear to be in the female farm work force, particularly since all labor force surveys recorded larger numbers of women than were in the population censuses (see Appendix Tables 10 and 11). The 1976 figures were admitted to be faulty by the Central Bureau of Statistics (CBS) because of technical difficulties in sample selection and lack of trained interviewers. Yet the numbers of females working on farms cannot have varied even as much as indicated by the labor force sample surveys (an increase from 221,000 female farm workers in 1974 to 309,000 in 1975).

If one only takes the male farm work force into consideration, there is much more consistency; the largest inconsistencies concerning numbers in this group are the drop in 1973 and the increase in 1974. The former apparently was a result of the drought which occurred that year. The wheat crop for 1973 was reported to be one-third that of 1972 on approximately 9 percent more land area, while the barley crop was reported to be only 14 percent as large as the previous year. Other major crops were also reported to have yielded one-fourth to one-half as much as in 1972. From the viewpoint of either labor requirements for a smaller crop or reduced farm income, a drop of this size in crop yields seems to be a logical reason for a smaller farm labor force in that year. The latter change in the 1974 male farm labor force (an even larger work force than in 1972) may at least be partially explained by a 26 percent increase in the area planted to vegetables and an 11 percent increase in the area planted to crops from 1972 to 1974.

Assuming then that the data concerning the male farm labor force are approximately correct, the trend indicates a decrease of 20 percent from 1970 to 1976, or an average annual decrease of 3.1 percent. Using the data for the farm work force as a whole, it apparently declined as a percentage of the total work force only slightly (from 50 percent to 49 percent from 1970 to 1975) but suddenly dropped to 31.6 percent in 1976. If one uses the percentage the male farm labor force bears to the total labor force, the decline is more gradual--declining more from 1974 to 1975 than from 1975 to 1976 (see Appendix Table 12).

As already mentioned, much of this change has occurred because of the wide variation in the number of farm women enumerated. It would appear that many women who participated part-time in farming were often missed in the surveys. Several reasons may account for these omissions. First, the censuses and surveys were all taken in September, a period of low activity in the farm sector; therefore, if the wife had not worked in farming recently at the time of the survey she might not be counted as a farm worker. Second, men do most of the work with tractors and animal power; their work is more visible and probably is considered more important by both husband and wife. Third, men may be reluctant, as in other cultures, to admit that the work of their wives is necessary to the farming operation, thereby admitting that the men cannot earn enough by themselves to support their families.

Thus, the number of women contributing to farm production must remain largely unknown, though it is very likely that the number enumerated for 1975 (in excess of 300,000) is much closer to the true figure than the 62,000 of 1976. If one postulates a percentage decline in female participation in the farm work force identical to that of men from 1970 to 1976 (a more likely occurrence than the 40 percent decline shown by the data), it would raise the 1976 figure for females to 83,000, the total number in farming to 598,638, and the percentage of the total work force being constituted by farm workers to about 32.4 percent--still a sizable decrease from 1975.

A second hypothesis is possible: the data for 1970 and the succeeding years for the male farm labor force were substantially correct, but that the female farm labor force was underestimated in 1970 and 1976. If one accepts the 1975 labor force figure of 300,000 females in the farm labor force as being nearly correct, and if this number did not decrease from 1970 to 1976, it would place the farm labor force for 1970 at 950,400 and for 1976 at 825,000. This hypothesis would appear to be closer to reality for two reasons: first, much of the mechanization that has taken place has been in field tillage, traditionally a man's task; and second, there apparently are few alternative job opportunities for farm women.



Even though more female workers were probably omitted in the 1976 data, the data for 1970 and 1976 seem to be fairly comparable on the Mohafaza level. Therefore, the following comparisons were made using the data for these two years. Of the 14 Mohafazat, over 20 percent of the farm labor force was in Aleppo in 1970; by 1976 this had decreased to less than 17 percent. Hama and Al-Hasakeh also had over 10 percent in 1970; both increased that percentage in 1976 (see Appendix Table 13).

Damascus City, Aleppo, Dar'a, and Sweida each experienced decreases in the farm work force from over 35 percent in 1970 to 19 percent in 1976. Although Quneitra, Hama, Deir-ez-zor, Idleb, and Lattakia experienced less than a 15 percent decrease, the change in the farm labor force as a whole was about 23 percent (see Appendix Table 14).

It is still uncertain whether the large decrease in farm workers, even for male farm workers, actually occurred or is simply due to errors in the data. However, a comparison of the apparent percentage decrease in the farm labor force from 1970-1976 by Mohafaza with the percentage increase in wage rates indicates that those Mohafazat in which wage rates were rising most rapidly in the 1970-1976 period were also those in which the most rapid decrease in percentage of farm workers occurred.

The farm work force apparently decreased from 30 percent to 40 percent in Sweida, Dar'a, Aleppo, and Damascus, but fell less than 10 percent in Quneitra, Hama, and Deir-ez-zor. For the four Mohafazat with the largest decrease in farm labor force, Sweida, Aleppo, Dar'a, and Damascus, the composite of the highest and lowest wages in construction increased from 40 to 111 percent for all four. Although the percentage changes in wage rates for the Mohafazat in which the farm labor force declined less rapidly were generally less, from 1975-76, Deir-ez-zor (with a 62 percent apparent increase in wage rates) had only a 7 percent decrease in farm labor force, and Lattakia (with a 30 percent increase in wage rates) had only a 15 percent decrease. This may be due to a combination of causes. First, data on 1976-1977 show a decline in wage rates in Deir-ez-zor, pointing to a possible exaggeration in the 1976 wage rate; for Lattakia, the data showed only a 6 percent increase. Thus, the wage rates in these two Mohafazat were either in error for 1976 or the wage rate in these two Mohafazat may already have been leveling off in 1976 (see Appendix Tables 15 and 16). Second, Lattakia has fairly large proportions of vegetable crops and tobacco, both of which have high labor requirements. A larger proportion of its wheat production is grown in areas in which the topography does not permit mechanization as compared to the other Mohafazat.

Thus, although the farm labor force has shrunk, perhaps it was not as much as the 1976 data indicate. This conclusion is in accord with the apparent increases in wages for picking cotton from

5 to 30 piasters per kilogram in five years. This evidence also seems to indicate that male farm workers have responded to higher wages in urban work by leaving farming in large numbers by 1976, a trend which has probably continued to occur.

2.3.2 Characteristics: Since no detailed information is available concerning the farm labor force in more recent years, the 1970 census data are used to provide certain characteristics of the farm labor force. The reader is advised to use this information with caution as changes have undoubtedly occurred in the past nine years.

The 1970 census classified the agricultural, animal husbandry and forestry workers, fishermen, and hunters in two ways. The first classification included farm managers and supervisors, farmers, agricultural and animal husbandry workers, forestry workers, and fishermen, hunters, and related workers. The majority of the workers were fairly equally divided between farmers and agricultural and animal husbandry workers, with only Aleppo, Hama, and Al-Rakka having more workers in the second category. Forestry, fishing, and hunting accounted for about 2,100 workers of the total of 732,821. The majority of Syria's 385 farm managers were reported in Damascus and Aleppo (see Appendix Tables 17 and 18).

A second classification was by employment status. The categories were unpaid family labor, wage workers, workers paid in kind, unpaid apprentices, self-employed, and employers. The largest group, accounting for over one-half of the total, were the self-employed. The second largest group were unpaid family workers (accounting for nearly 30 percent). About 17 percent of the farm labor force were paid wages; employers accounted for only about 1.1 percent of the total. These proportions indicate that each employer used an average of about 15 workers, which seems unlikely. Very probably, some employers are listed in other types of work, and some people listed as self-employed may also be part-time employers, though according to the international classification system they should not be counted as such. It is also probable that some workers are employed by persons who own a farm, but are not enumerated since they have other occupations (see Appendix Tables 18, 19, and 20).

Only about one-third of the agricultural labor force in 1970 was reported to be literate, though this proportion varied greatly (from 18 percent in Al-Hasakeh and Al-Rakka to 56 percent in Sweida). The workers appeared to have been slightly more literate than the farmers for Syria as a whole, but this varied by Mohafaza. About two-thirds of the farm managers were reported to be literate (see Appendix Table 21).

Information concerning the literacy level of the farm labor force for 1976 was not available; therefore, data presented here concern the change in literacy levels for the total labor force by

Mohafaza and sex. The literacy level was extremely low for 1970--only 51 percent for the total work force (about 55 percent for males and 22 percent for females). By 1976, these percentages had increased to 68 percent for males and 51 percent for females. Thus the greatest change in literacy was in the female work force, though females still lagged behind males in literacy.

Very large differences were noted between Mohafazat, however. The male work force literacy level in 1970 ranged from 78 percent (in Damascus City) to 30 percent (in Al-Hasakeh); for the female work force the range was from 75 percent (in Damascus City) to 2 percent (in Al-Rakka). The highest literacy level for the female work force was in Damascus City (88 percent), higher than for males (78 percent); the lowest was 17 percent (in Deir-ez-zor), except for Quneitra (see Appendix Table 22).

Thus much progress had been made by both sexes in improving literacy levels. If the same progress has been made by the farm labor force based on percentages presented earlier, the literacy level for the farm work force should have been about 50 percent by 1976 and above that by now.

The 1970 work force in farming consisted of a higher proportion of workers above age 60 and below age 19 than did the nonfarm work force. For males, 32.5 percent of the farm work force consisted of those over 60 or below 19; for females the percentage was 54.5. This compares with approximately 18 percent for the nonfarming male work force. It appears that daughters are more likely to be considered part of the work force than wives who are considered to be housewives, though it is very likely that many wives provide labor for farming (see Appendix Table 23).

In all cases, the agricultural labor force consisted of a higher proportion of people under 20 and over 64 years of age. The over-64 age group ranged from 5.6 percent to 11.7 percent of the farm labor force and 1.9 percent to 4.3 percent of the nonfarm group (see Appendix Tables 24 and 25).

2.3.3 Summary: While the Syrian rural population as a percentage of total population is decreasing, it is still growing quite rapidly. In fact, it had apparently grown by about 100,000 people per year from 1970 to 1976. According to my interpretation of the farm labor force data, the number engaged in farming dropped considerably over this period. Thus it appears that the participation of rural people in nonfarm occupations increased substantially, by an increase either in the number of rural sector jobs or in the number of rural people commuting to work in the urban sector. While the data do not appear to be very reliable, one conclusion of this study is that the Syrian farm work force has decreased substantially and is continuing to do so.



The data for 1970 indicated that many rural workers were landless; therefore, it is likely that many of them sought work elsewhere, in either farm or nonfarm work. The proportion that would be available depends on the permanency of their work relationships, a factor about which I found no reliable data.

Almost one-third of the farm workers were unpaid family workers. It is unknown to what extent these workers contribute to the operation of the farm. However, inasmuch as a substantial portion of this group consists of young persons (below 20 years of age), particularly girls, this group would also seem capable of contributing to the work force in a paid capacity. In other words, one could expect that some of these young people would be available for remunerative work, farm or nonfarm, if it were available at a wage somewhat above the value of food and lodging that they receive as part of the farm family.

Literacy levels are quite low. This has implications for training and education of the farm labor force. The rather rapid advance in literacy levels for the total labor force, however, gives evidence that this is probably a much smaller problem than previously, and certainly less so for younger people.

Comparison of the proportions of various age groups in the farm work force compared to that for the nonfarm work force indicates that there is a somewhat larger proportion of workers under age 20 and over age 60 in the farm work force. The disadvantage this indicates in terms of work capacity will, however, lessen as mechanization increases.

### 3. Labor Requirements

This section is a description of the methods used and the results obtained from an attempt to determine labor requirements for farming by Mohafaza and by month.

#### 3.1 Introduction

An attempt was made to determine the most important crops within each Mohafaza (without considering all of the minor crops) in order to account for as much crop labor as possible. Both acreage and value were considered, since using acreage alone would exclude certain crops with high labor requirements. Twenty-two crops were included in the analysis: not more than 16 appeared for any one Mohafaza, with an average of 11 per Mohafaza. The 22 crops include 2 grains, 2 dry legumes, sesame, vetches, cotton, sugar beets, tobacco, 4 fruits, and 9 vegetables (see Appendix Table 26).

The 22 selected crops, when we omit small acreage crops in some Mohafazat, occupied almost 97 percent of the total land area in crops. There were differences in this respect by Mohafaza, however. In Al-Rakka, two crops (wheat and barley) occupied almost

99 percent of the total cropped area, whereas in the Mohafaza of Damascus, 16 crops occupied only 73 percent. These differences reflect the concentration on a few crops of farm production in Al-Rakka, in contrast to the many different crops, particularly fruits and vegetables, grown in the Damascus Mohafaza. (Data for farming operations within the city of Damascus were added to the data for the remainder of the Mohafaza.)

An omission of a particular crop for certain Mohafazat does not mean that the actual area sown was less than in those Mohafazat for which it was included; rather, that it was less important in terms of the total land area devoted to crops within those Mohafazat. For example, eggplant was included for Lattakia but excluded for Homs, even though only 689 ha. were grown in Lattakia and 917 in Homs. But the proportion of eggplant in the total cropped area was greater for the former than for the latter since the cropped area for Homs was nearly three times that of Lattakia. In general, few crops were included for a particular Mohafaza if the cropped area was less than 1,000 ha.

The hectares included in the analysis of the 22 crops by Mohafaza are shown in Appendix Table 25, along with the omitted hectares for each of the 22 crops and the omitted hectares of all crops per Mohafaza.

On the labor requirements for the various field operations, data were obtained from the Ministry of Agriculture. This information had been gathered in various Mantika where the particular crop was important by personnel from the Ministry of Agriculture who interviewed several farmers at the same time. This information varied greatly from one Mantika to the next, even for adjoining Mantika. It is suspected that these variations are due more to differences in judgment than actual differences in situations, although these vary greatly (depending on the use of animal or hand labor versus the use of tractors and power equipment).

Another source of information was the budgets obtained from the Agricultural Relations Department of the Ministry of Social Affairs and Labor. These data were prepared by and represent agreements reached among committees of sharecroppers, landowners, local Ministry of Labor representatives, and others. Since they are used to determine how the crop will be shared between the landowner and the farmer according to the contributions of each, they are carefully prepared. However, they are cast in terms of cost rather than labor requirements; therefore, the labor requirements had to be computed from other information (based on wage rates). While the Ministry of Agriculture information included wage rates, the estimates varied. For instance, cost estimates from the Peasant's Union on the whole were slightly lower than from other sources, even though they referred to 1978 while the others were mostly for 1975 or 1976 (with just a few for 1977).



The reader is warned not to accept the labor requirements presented here as very accurate. Because of the complexity of agriculture in Syria, many simplifying assumptions were made. While data were obtained from the Ministry of Agriculture concerning planting and harvesting dates, the time schedule for other operations was estimated, and each was assigned a time that seemed most logical. Some of these problems will be discussed in the following section.

### 3.2 Labor Requirements for Crops

One of the difficult tasks of the study has been to determine realistic labor requirements of individual farm operations for crop production. The one area of reasonably close agreement was pre-plant tillage operations. What was difficult to determine were the numerous combinations of methods used and the proportions of each, taking the country or the Mohafaza as a whole. The degree of complexity is even higher for nontillage operations. The differences in labor requirements using different implements and power sources are so great that to assume all work was done by the most time-consuming methods would indicate the need for more workers than exist in Syria, whereas to assume the methods used the lowest labor requirements would necessitate only a fraction of the present farm labor force. Therefore, for wheat and barley (because of their large acreage they are crucial in labor needs estimation), standard labor requirements were estimated from the available information; the proportion of each method used was adjusted by Mohafaza according to the topography, the degree of mechanization as indicated by the number of combines and threshing machines per Mohafaza, and by the apparent availability of labor per Mohafaza.

3.2.1 Wheat and Barley Crop Requirements: Two types of plowing are used, but the implements utilized are very different, as are the results of the tillage. Much of the farmland is apparently plowed with tractors. Estimates of time used for plowing 1 hectare averaged about three hours per hectare (which is remarkably close to my own experience with a tractor and two-bottom plow, the type used most frequently in the regions I have seen). Plowing with the old style, single point plow is generally estimated at 30 hours per plowing, with two or three plowings being performed. It appears that plowing with the tractor shortly after harvest is common practice, with animal tillage being used to further prepare the soil.

Even with relatively low wages, the cost of plowing by tractor is much less than by animal; yet the use of animal plowing in addition to tractor plowing seems to be continuing. Perhaps this is due to lack of opportunity cost for animals and human labor. Or, to state it another way, to pay someone to plow by tractor requires cash payment; to plow with animals is a cost only if the animal and human resources can earn more elsewhere. Perhaps custom is also a factor.

Weed control with herbicides is apparently cheaper (and probably more effective) than hand weeding of grain, but again there is a cash-cost factor involved in herbicide use, while there may not be in hand weeding--especially if this is done by unpaid family labor.

It is in harvesting, however, that differences in methods seem to be greatest. Apparently, there are cases where threshing is still done by animals treading on the grain, while workers (probably women and children) winnow and sift the grain from the debris. More common, however, is hand cutting with threshing done by machine. This appears to have given way to direct combining in many areas. Exceptions appear to be in some irrigated areas where it is difficult to cross some of the land formations made for irrigation; in mountainous areas where the plots are too small and access is impossible; and in excessively rocky areas. Another reason for hand harvesting seems to be a greater recovery rate of straw which is highly valued for feed.

As mentioned earlier, the labor requirements used in each Mohafaza are a composite of the three methods: most mechanized, least mechanized, and partially mechanized. In Appendix Tables 27 and 28, the labor requirements for the three methods are shown; in Appendix Table 29, data on mechanization by Mohafaza are shown.

3.2.2 Other Crops: Although labor requirements were described in some detail for wheat and barley, this will not be done for other crops for two reasons. First, none of the other crops is as important as these two combined, and therefore none is as important to the overall analysis of labor requirements. Second, the description of labor requirements for the grains gives a general idea of the wide range in labor requirements per hectare that is possible to project and still remain within the range of actual hours spent in crop production. The same is true of other crops, but the analysis is not as sensitive to differences in per hectare requirements for those crops on small plots. For further details on labor requirements of the other 20 crops, see Appendix Tables 27-49.

3.2.3 Computation of Labor Requirements: For each Mohafaza, hourly labor requirements for each field operation by crops considered important enough to be included for that specific Mohafaza were multiplied by the number of hectares of that crop grown and divided by eight to convert to man-days. Total labor requirements, as calculated by the above method, are presented in Appendix Table 50 by Mohafaza for the 22 major crops. Three crops--wheat, olives, and cotton--seem to have over one-half of the total labor requirements for the 22 crops.

Because of the omission of varying proportions of crop area for the various Mohafazat (for both the 22 major crops and the other miscellaneous crops), an obvious adjustment must be made before comparisons can be made between Mohafazat. Ideally, this would

be done by considering labor requirements for all the omitted crops by month. But the omission was originally made to avoid the amount of detail this would involve. Therefore, a simplifying assumption was made: all the remaining area required 250 man-hours per hectare, a compromise between extensive and intensive crops. Since it was not known in what months such labor would be required, it was allocated equally to all 12 months. Obviously, this includes error but it is better than no estimation for these crops (see Appendix Table 51 for the results of these estimates).

Inasmuch as labor requirements for livestock production have not been taken into account, an estimate was also made to include such labor needs. With only a general knowledge of how livestock is distributed in terms of herd size, the assumption was made that two-thirds of the milk cows and one-half of the sheep and goats were kept mainly for household use and therefore the number that each family owned could be taken care of by working an extra hour or two in addition to the daily eight hours each worker has been credited with. Of the remaining one-third of the milk cows, it was assumed that one worker would take care of 20 milk cows plus assorted other cattle. Of the remaining one-half of the sheep and goats, one worker was credited with caring for 150 milking and non-milking animals. The standard for milk cows was established on the basis of the writer's experience; the one concerning the sheep and goats on the statement of researchers that one man, perhaps with family help, cares for 150-200 animals where flocks are of large size.

The result of these allowances in labor requirements was to increase the overall labor requirements for the total farm sector from 70 million man-days to 90 million man-days. The increases were proportionally greater for some Mohafazat than for others, however, with Homs showing a far larger proportional increase than Tartous, for example (see Appendix Table 51).

The omitted area of about 281,000 ha. was calculated to require about 8,779,000 man-days of labor (see Appendix Table 51). Two groups of omitted crops were considered. For 59,000 ha., mostly of vegetables, about 500 man-hours per hectare were calculated as the labor requirements. The other group of omitted crops consisted approximately of 222,000 ha. (for a total of 281,000 ha.) of some 40 other crops grown in Syria, and was allocated slightly over 5 million man-days. The number of remaining man-days was thus about 185 man-hours per hectare, which is slightly below the number projected for the total hectares not included in the original analysis. While the other crops do consist of some low-labor requirement crops, there are many different types of fruits and vegetables. On balance, it would seem that the additional labor projected for those crops not included among the 22 major crops considered in the original analysis may be somewhat low. This is especially true for Damascus where, despite the inclusion of 16 crops, only 73 percent of the area was included in the original analysis (many vegetables and fruits are grown in that Mohafaza).



Decisions were then made to allocate the required man-days to those months in which labor would be required by the specific crop. These labor requirements were allocated for each field operation by the most logical means possible, i.e., by simply assuming that plowing and tillage took place before seeding; and that weeding, hoeing, irrigation, and insect control took place sometime between seeding and harvest. These assumptions were necessary since information concerning only the seeding and harvesting periods was available from the Ministry of Agriculture. This placement of these operations may be wrong in some instances, but probably is not too inaccurate. In addition, some would tend to vary by season depending upon rainfall, as this is the principal determining factor for the timing of irrigation and plowing.

For fruit crops, tillage was done throughout the year, since it probably takes place most often when other work in orchards is low. Pruning was indicated for the months when no fruit would be forming. A field trip in early March yielded some observations which were useful for determining the timing of a few operations.

Some complications arose, however. First, more than one planting and harvesting time may exist for an individual crop. There are spring, fall, and winter potatoes, summer and autumn sugar beets, and many other vegetables which are also planted in succession. Second, crops may be planted at different times in different regions of the country.

In some cases, the month may be too large a unit of analysis in that the crucial period for harvesting may be less than the month or two designated for that operation. For example, the data show that wheat is harvested in May and June (unless irrigated). The question is whether a shorter period of time may be more desirable to insure that the crop is harvested without loss. Another problem is how to allocate man-days when harvest begins about the middle of a month. Should one allocate the full number of man-days for the entire month or one-half of it? By allocating only one-half, the crucial nature of the labor shortage would be understated while if one allocated the full amount, it would tend to overstate the total number of man-days required. Also, the time of planting and of harvesting may vary from year to year due to weather conditions.

The following assumptions were made, ignoring these complexities. First, all crops were assumed to be planted and harvested at the time that the data indicated the largest proportion was planted and harvested. The correct times for these tasks were ignored for the rest of the crop, since it was not known what proportion of these crops was produced in each Mohafaza. Second, allocation of harvest labor was made for the entire month or two-month period, ignoring the problem of crucial shorter periods. Third, where a particular operation began or ended within a month, the total man-days were counted for the entire month. Fortunately, there were few such instances.

The data on requirements by months indicated that for the country as a whole, June was the month with the most labor activity, and that May, July, and October were also high months. The lowest labor requirements were during the months of January and December (see Appendix Table 53). Since the actual months during which labor was required for the 22 crops and for the miscellaneous crops were not determined, we assume that the estimated crop requirements were spread evenly throughout the year. This probably tended to overestimate the symmetry of calculated labor requirements. (Another method could have been to allocate these labor requirements in the same proportions, among months, as for those already calculated. However, this would probably prejudice the results too heavily toward the grain harvest period.) Livestock requirements were also divided equally among the 12 months. While there are certainly some differences in labor requirements during the year, this method of allocation should not be too inaccurate for the animal labor requirements.

As can be noted from Appendix Table 54, the same seasonal pattern was obtained for the total labor requirements as for the 22 crops shown in Appendix Table 53. Table 54, however, suggests different ranges between the lowest and highest months and the monthly variations seem less (although numerically they are the same in both tables). A comparison will be made in Section 4 of this report between the labor requirements as developed in this section and those of the farm labor force as discussed in Section 2.

### 3.3 Required Skills of Farm Workers

Up to this point, the farm labor requirements have been discussed solely in terms of number of workers needed without consideration for skills required. This, no doubt, is an oversimplification of the labor requirements, but a necessary assumption if we are to gain an indication of the number of workers needed.

Many farming operations, particularly hand labor, do not require a great deal of skill beyond that gained by experience in a relatively short period of time. Where machinery and equipment are concerned, however, somewhat more skill is required. For instance, learning to drive a tractor does not require much training or education, and most people can learn how very quickly. However, safety in the operation of tractors and equipment, proper maintenance (particularly of tractors), and proper adjustment of field equipment (especially of plows and combines) require much more instruction and training. Proper training in the use of insecticides, herbicides, and fungicides is extremely essential. These pesticides must be used properly for the safety of both the user and the eventual food consumer, particularly of fruits and vegetables.

While the above comments apply to all hired or self-employed workers, the self-employed and employers need a great deal more skill and training in farm management. These details will be discussed in a later portion of the study.



#### 4. Estimation of Underemployment and Worker Shortages

A series of tables for each Mohafaza and for the country as a whole was made to show the similarities and differences in labor use between Mohafazat (Appendix Tables 53-55) and for the country as a whole (see Figure 1). The reader is cautioned, however, to interpret the peaks and troughs of labor use as occurring during most of the month indicated, rather than just at the beginning of the month.

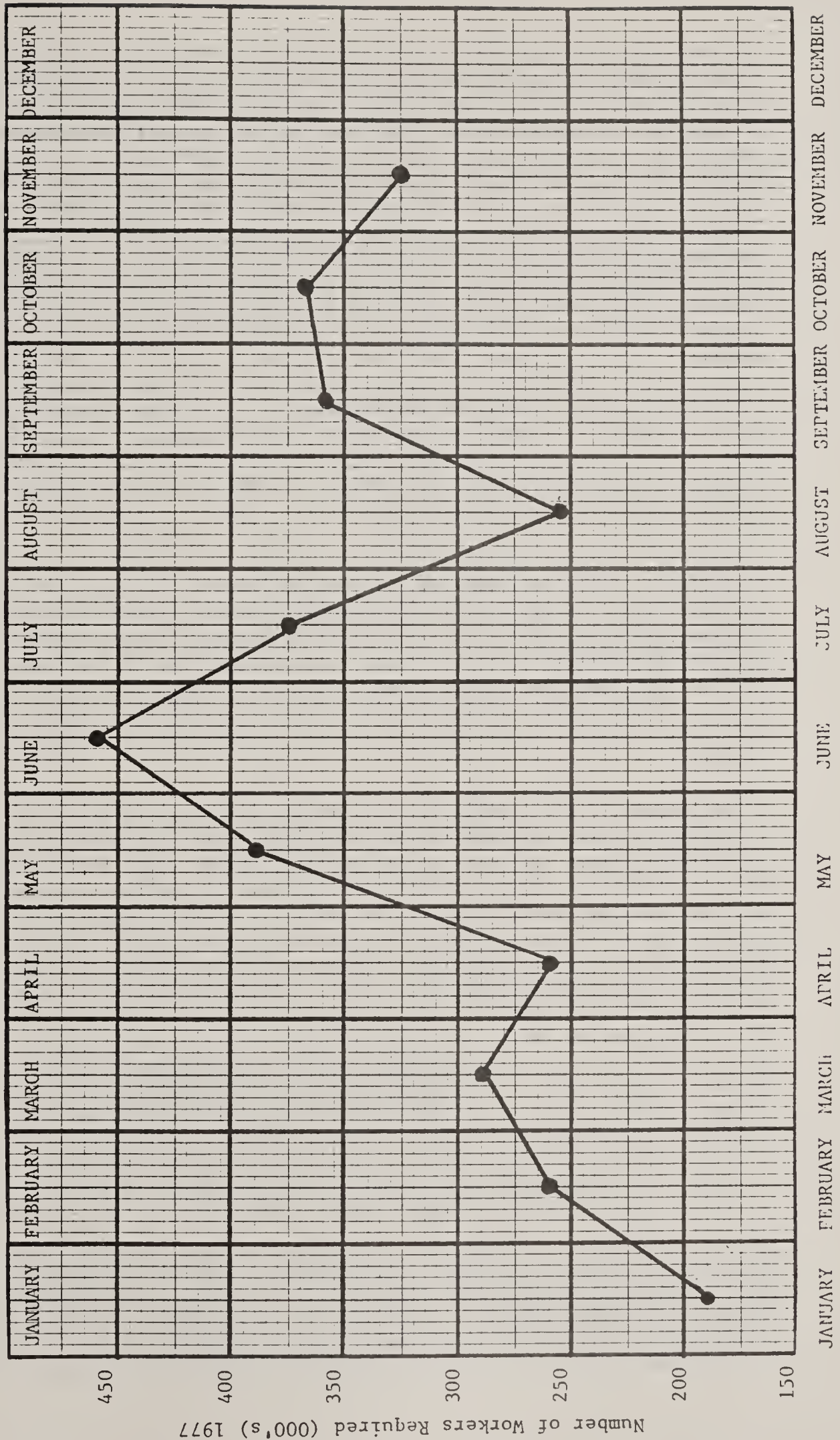
##### 4.1 Monthly Labor Requirements Compared to Farm Labor Supply, by Mohafaza

The most outstanding similarity in the pattern of labor requirements between Mohafazat were for the months of January and December. This tendency was strongest in the major grain-producing areas. The most notable exception to this pattern was Tartous, for which there were two other periods of low labor requirements. A second tendency was a period of low labor requirement in August (after grain harvest), though for Aleppo and Lattakia this trough occurred during September (see Appendix Table 54).

Dar'a and Sweida had labor requirements that apparently exceeded the available labor supply by 10 and 20 percent, respectively, in May and 12 percent (for Sweida) in June. This should not be interpreted as necessarily meaning these two Mohafazat imported labor during the month of May for it may quite simply be due to an underestimation of the degree of mechanization in these Mohafazat. Another factor here was the harvest of vetch; I have estimated that all of this crop was harvested in May, which was not true for other cereal and dry legume crops. If the labor requirements did indeed exceed the capacity of the indicated work force, these requirements may have been met in two other ways. First, as the requirements for the number of workers were based on a 25-day month and an 8-hour day, the workers may, like most farm workers during peak seasons, simply have worked more hours. Second, as conversations with development center personnel in Dar'a indicated, persons not otherwise in the work force, such as students, may work during harvest. For Al-Hasakeh also, the labor requirements seemed to have exceeded the available work force by 2 percent in June--again which may be due to an error in estimation of non-grain crop mechanization (I assumed almost 100 percent mechanization of the grain harvest).

There was a considerable difference between Mohafazat in the relationship of farm labor force and the apparent labor requirements. For example, the peak month for Damascus barely reached 50 percent. This indicates an underestimation of labor requirements, particularly for the large proportion of the area (27 percent) remaining in that Mohafaza after labor requirements for 16 crops were accounted for.

FIGURE 1: Farm Labor Force Required by Month, 1977



There is serious concern about labor shortages for three crops --sugar beets, cotton, and olives--particularly for harvesting. Most sugar beets are produced in three Mohafazat: Homs, Hama, and Al-Rakka. Of these, only Al-Rakka (as far as each Mohafaza as a whole was concerned) showed large requirements compared to the available labor force. Labor requirements appeared to be about 70 percent of the labor force in Al-Rakka during July, September, and October, as compared to 60 percent or less for Homs for these three months and 50 percent or less for Hama. According to information from the Ministry of Agriculture, autumn sugar beets, planted in autumn, are harvested in July and August; summer sugar beets, planted in February and March, are harvested in September and October.

Cotton, grown mainly in Deir-ez-zor, Al-Hasakeh, Aleppo, Hama, and Al-Rakka, is generally harvested between August 15 and November 15. Al-Hasakeh showed a peak labor utilization of 85 percent in September and 70 percent in October; Aleppo reached about 70 percent for October and November.

Olives are most heavily grown in Aleppo, Idleb, Tartous, and Lattakia. The olive harvest season is October through January. Of this crop, Idleb seemed to have high labor force requirements in proportion to its work force (80-90 percent from September through November). For Tartous, the rate was 80-95 percent for October and November. For Aleppo, the rate appeared to be only about 70 percent for October and November. For all Mohafazat (including these four), the rates were quite low for January and December.

As shown in the tables, there does not appear to be as extreme a labor shortage during the cotton, sugar beet, and olive harvests as for the grain harvest, in spite of the fact that more is heard about labor shortages for the former three crops than for grains. Of course, the data may simply be wrong. But there may be another explanation. Wheat, barley, and to some extent the other crops harvested during the May-July period are more widespread than are the three more labor-intensive crops. Therefore, the shortages of farm labor that exist for grain harvest can be more easily solved by working longer hours or hiring persons not ordinarily in the farm work force from the local community than shortages for other crops. Sugar beets, cotton, and to some extent olives are grown in more restricted areas and, with high labor requirements per hectare, the demand for labor is more highly concentrated.

In terms of the proportion of labor requirements, Tartous, Idleb, and Sweida had average labor requirements of 76 percent of the farm work force in those Mohafazat; this compares to averages of 45 percent or below for Lattakia, Quneitra, Damascus, Hama, and Al-Rakka (see Appendix Table 53). For the country as a whole, labor requirements were 53.3 percent of the farm work force on the average throughout the year, which is slightly above the 50 percent calculated for the U.S. in a previous study by this writer.



All of the tables were prepared and the labor shortages noted on the basis of a farm labor force of 578,000 according to the 1976 Sample Population Census. If, however, as seems likely, the farm labor force contains large numbers of women who were not counted in the Sample Census, it would mean that even at the peak periods of labor requirements, there would be enough workers present considering each Mohafaza as a whole.

Comparison of peak periods between Mohafazat show that very few of them do not have a peak period in the May-July grain and legume harvest period. Exceptions are Lattakia and Damascus, both of which have low labor requirements compared to the labor force size throughout the year, possibly because of underestimation of labor requirements for fruits and vegetables. However, one official said that there is never a shortage of labor in Lattakia, indicating that there may, in fact, be underemployment in that Mohafaza.

The period of September through November also requires considerable amounts of labor, depending on the extent that demands for two or all three of these crops (olives, cotton, and sugar beets) coincide. Again, the same comments apply in relation to Damascus and Lattakia. The data indicate, in addition, rather low labor force requirements in relation to the farm labor force for Homs and Hama, in spite of the fact that Homs is one of the leading producers for both sugar beets and cotton. Also shown in the data are low labor requirements for Dar'a in the autumn; this is reflected in the comments of people in Aleppo that workers come from Dar'a for olive picking.

In short, our analysis shows no overall farm labor shortage in Syria, but it does show possible shortages in a few Mohafazat for summer grain harvest. For the autumn period, harvest labor shortages appear less severe for the Mohafazat as a whole, but they are likely to be more serious in the local areas where these crops are produced. It appears that in spite of regional and seasonal labor shortages, there is still a considerable amount of underemployment based on the number of days worked by each individual throughout the year. This topic will be further discussed in Section 7 of this report.

#### 4.2 Additional Evidence Concerning Underemployment--Farm Labor Shortages

Some additional evidence concerning underemployment versus farm or labor shortages will be presented in this section on trends in rural and farm unemployment, wage rates, changes in cultivated land area per worker, and gross productivity per worker.

4.2.1 Unemployment in Farming: According to the Central Bureau of Statistics (CBS), a person is considered employed if he worked for at least three hours on the day of the survey or "if he could not work for seasonal reasons or because of illness or other reasons." The Population Sample Census and the labor surveys are both

done in September, a period of light farming activity. September, therefore, is a good time to take a population survey that records people as residents where they are at the time of the survey, but possibly a poor moment for a labor survey.

About 6.5 percent of both the rural and the urban labor forces were unemployed in September of 1976. However, there was wide variation by Mohafazat. Sweida, Tartous, and Deir-ez-zor reported urban labor force unemployment of over 10 percent, with Lattakia almost as high. For the rural labor force, these same Mohafazat had less than 10 percent unemployment, but Al-Hasakeh recorded over 10 percent (see Appendix Table 56).

According to the Statistical Bulletin of the Ministry of Social Affairs and Labor, unemployment increased by 28 percent (from 88,000 in 1975 to 113,000 in 1976), or from 4.8 percent to 6.2 percent of the total labor force. However, the number of unemployed listed as farmers declined from 21,000 (24 percent of unemployed) to 14,000 (12 percent of the unemployed). Owing to the inflated figures for the 1975 farm labor force, the apparent percentage unemployed of farmers was 2.3 percent for both years.

The number of people seeking work for the first time increased from 45,000 to 67,500 from 1975 to 1976 (from 51 percent to 60 percent of the unemployed). The number and percentage of unemployed farmers was extremely low. It would be interesting to know how many of those seeking work for the first time were sons and daughters of farmers. A perusal of unemployment office data showed the principal reasons for seeking work in the city of Damascus were lack of land and lack of jobs in the home community. Most of those registering were young men in their late teens and early twenties. It is unknown how much this increase in persons seeking employment was due to an increase in awareness of employment opportunities. The unemployment office in Damascus reported that 80 percent of job applicants in that city came directly from villages.

Data concerning unemployed farmers showed that only 2.4 percent for the country as a whole considered themselves unemployed in September of 1976, ranging from 1.1 percent in Sweida to 3.3 percent in Tartous, with the exception of 9.1 percent for the small number of farmers within Damascus City. Again, one can only speculate if the latter figure represents a true difference in unemployment or merely a greater awareness of opportunities for nonfarm employment (see Appendix Table 37). Inasmuch as this evidence indicates a trend, it tends to strengthen the argument that there is a greater shortage of farm labor than previously existed.

4.2.2 Wage Rates: Minimum wage rates are set for farm workers for each cropping operation and for each Mohafaza. These wage rates are set by a committee of employers, employees, and officials in each Mohafaza and then are approved by the Ministry of



Social Affairs and Labor. They are supposed to reflect actual living costs in the various Mohafazat. But these minimum wages have not been brought up to date from 1977 and are said to have been mostly exceeded by 1978 and certainly by 1979 (see Appendix Table 57 for a copy of the 1977 minimum wage rates). These rates varied from S.f 4 per day in 1977 in Idleb for hoeing to S.f 6.5 for harvesting. By contrast, the wage rates for the same tasks were S.f 8.34 and S.f 9.96 in Aleppo Mohafaza, respectively. The average minimum wage by Mohafaza ranged from S.f 4.71 for Idleb to S.f 8.52 for Aleppo. Wage rates were set much higher for harvesting than for threshing.

Some evidence--Ministry of Agriculture crop budgets--indicates that wage rates did not greatly differ from task to task, nor from Mohafaza to Mohafaza (see Appendix Table 58). Hourly wage rates shown are for 1975 for Damascus and Idleb, 1976 for Idleb, Lattakia, and Aleppo, and 1977 for Dar'a. In addition to the lack of any discernible regularity in the differences over task or Mohafaza, there does not appear to be any trend toward higher wages from 1975 to 1977.

The average wage rate for Damascus does, however, appear to have been higher than for Idleb, but evidence is far from conclusive. The S.f 1.71 hourly wage rate indicates about S.f 14 for an eight-hour day for 1975. This seems quite high in view of the fact I have been told by an employer that in 1978 he was paying S.f 10 per day to women workers in the Damascus City area, though he would have to pay S.f 14 in 1979. (In 1979 he would have to pay S.f 20 per day to men.) This individual asserted that men could earn S.f 35 per day for an eight-hour day, but that they often prefer to work five hours and earn S.f 20-25.

Respondents in Dar'a stated the wage rate of harvest labor was S.f 4-6 per hour, which would imply earnings of S.f 32-48 per day. However, the same persons said that 12-16 year old girls also harvested for S.f 10 per day.

Persons in the Aleppo Mohafaza reported wages of S.f 8-10 for women, with foremen receiving double those rates. Irrigation workers were said to be paid higher wages (from S.f 25-30 per day). In cotton, the rate was said to be 30 piasters per kilo, with average amount picked per day at 40-50 kilos, though some can pick 60-70 kilos at yields of 200-205 kilos per dunum. This would imply earnings of S.f 12 to S.f. 21 per day for picking cotton. Sources in the Ministry of Social Affairs and Labor asserted that the wage rate for picking cotton had risen roughly 15 piasters from 1975 to 1978 (from 5 to 20 piasters), although this figure may be low since published data from the same ministry indicated 1975 rates were about 10.5 piasters per kilo.

In general, approximately one-fourth of the cotton crop must be paid to the picker. At the price of 190 piasters per kilo,

25 percent for picking would yield approximately 48 piasters. Although some technicians asserted that as much as 50 piasters per kilo is paid to workers, the 48 piaster figure is high. Data from the Peas t's Union placed the price at 15 piasters for the first picking of 200 kg./dunum and 25 piasters for the second picking of 50 kg./dunum. It is probable, then, that the highest prices quoted are for picking the second (or even the third) time when the yield is less, since the worker must be paid more if he is to earn as much as at a lower per kilo rate but with better picking.

For olive picking it is common for the worker to receive one-seventh of the crop, that is, six olives go to the owner and one to the picker. This would mean that someone who picked 70-100 kilos per day would earn a daily wage of S.£ 20-30. At another village in Aleppo, it was said that four workers could pick ten olive trees per day with an average yield per tree of 30 kilos of olives. This would imply 75 kilos per day per worker (which is probably too high for the country as a whole in view of the reported yield of approximately 9.5 kilos per tree in 1977 and 13 kilos per tree in 1976). Using the Aleppo average of 16 kg./tree in 1977, a worker who picked 2.5 trees per day with an average price of S.£ 2 per kilo would earn only S.£ 11.5 per day if s/he was allotted one-seventh of the crop. In this same village, the average wage rate for men doing hard work was S.£ 25 per day, but only S.£ 15 per day for light work, and S.£ 8-12 for girls. Wages, then, vary widely across regions, but even more widely between the sexes.

We can conclude that wage rates in farming are not high enough to attract men who could earn only up to S.£ 20-25 per day on the farm (at least on a regular basis) and S.£ 30 to S.£ 50 in the city. Wage differentials tend to favor a situation where men go to nonfarm employment leaving much of the farm work in the hands of women who still work for S.£ 5-15 per day.

It is difficult from such conflicting evidence to determine the extent to which wage rates in farming have increased in recent years. It seems apparent that they have increased, but whether they have risen more rapidly than the rate of inflation and prices of farm products would be difficult to ascertain. It appears, however, that wages paid to women for most work have not increased very much, while those for men have. This indicates that the relative earning opportunities in off-farm jobs for men are greater than for women.

#### 4.3 Underdevelopment as Low Productivity

Up to this point, the problem of underemployment versus labor shortage in Syria has been examined solely from the viewpoint of the numbers of people employed in farming versus the amount of farm work to be done. But underemployment, from the viewpoint of hours worked, is due more to the biological nature of farming than to any particular organization of farming. It would thus

appear that the question of underemployment relates to the productivity of the workers and not the number of hours worked. As mentioned earlier, it would appear that U.S. farm workers are more underemployed than their Syrian counterparts since the amount of farm labor required seems to be a slightly lower percentage of the farm work force available. U.S. farmers, however, are relatively productive and prosperous.

It is evident, then, that the key to understanding the farm labor situation in Syria is to examine the productivity per worker. As will be discussed at greater length later, the productivity per worker is a function of two elements--productivity per land and animal unit, and the number of land or animal units handled per worker. At this point, however, I will discuss the relationship between the number of cropped hectares per worker and the value produced per hectare and per worker.

As mentioned earlier, I have used the 1976 labor force data, in part because it was the most recent data set available which indicated labor force by Mohafaza. In the following productivity comparisons one must keep in mind that if the farm labor force consists of a large number of women not accounted for in the 1976 data, then these comparisons overstate productivity by as much as one-third or even more.

The land area planted to crops for the country as a whole increased about 20 percent from 1970 to 1976 while the number of farm workers apparently declined by about 30 percent. As a result, the planted area per worker increased from 4.5 ha. in 1970 to 7.03 ha. in 1976, varying from 0.8 to 8.1 ha. by Mohafaza in 1970 and from 2.05 ha. to 14.26 ha. in 1976. This, of course, reflects a different mix of crops between Mohafazat, adaptability of terrain to mechanization, and other factors. It does indicate, however, about a 56 percent increase in farmland per worker in the six-year period, probably reflecting both the effects of mechanization in some areas and the pull of nonfarm jobs as well (see Appendix Tables 60 and 61). As per hectare yields have increased (due to more irrigation and improved practices), the total agricultural production of Syria has virtually doubled from the 1970 period. Since production varies a great deal from year to year, a direct comparison of 1970 and 1976 is not very meaningful, especially when reported in broad categories. It is apparent, however, that production per farm worker has increased even more than the increase of 56 percent in land area per worker, since yields have also increased.

In order to find the total value of crop production, the quantity of the 22 major crops produced was multiplied by the price of each crop per Mohafaza. The Mohafaza totals were then summed to reach the total value of the crops. However, the percentage these crops constituted of the area in each Mohafaza varied from 76 to 97 percent. Therefore, in order to make a reasonable adjustment for these differences, the value of production was divided by the



percentage that the area these 22 crops represented in the total area per Mohafaza. This assumed that the value of production on the remaining hectares was the same as for the 22 crops accounted for.

The value of production per hectare ranged from S.£ 593 in Al-Hasakeh to S.£ 349 in Damascus. There are two important reasons for this large difference: the proportion of irrigated land, and the mixture of crops grown. Wheat production yields less value per hectare than most other crops, but costs are also less, particularly for labor (see Appendix Table 62).

Appendix Table 63 shows the value of production of crops per worker. These data do not include animal production, which means that there is a bias in favor of the Mohafazat which are least involved in animal products. The value of crop production ranged from S.£ 5,983 in Lattakia to S.£ 11,234 in Aleppo, with the average for the country as a whole being S.£ 8,891. Insofar as this represents an accurate value of production per worker, it indicates that if there were no other costs of production, the average worker would make only S.£ 29.6 per day if he worked 300 days per year. If, as indicated earlier, he worked 53 percent of the 300 days, a more reasonable proportion, he could earn more on a daily basis but it still would represent less than S.£ 9,000 per year. Given that there are other costs of production besides labor, the value of production which can be credited to labor would be perhaps about one-half this amount.

Since no allowance in the above analysis has been made for value of livestock production, an adjustment was made to take into account such production by Mohafaza. Adding the value of animal production (after adjusting animal production so as not to double-count crops used as animal feed) raised the value of production to almost S.£ 14,000 in Homs which put it ahead of Aleppo (slightly less than S.£ 13,000). The average for the country as a whole was slightly over S.£ 10,000, with Lattakia being raised to S.£ 6,492. One can see that with a gross annual value of production per farm worker as low as S.£ 6,500, it would be difficult to pay very high wages. If one-half of the production costs can be attributed to costs other than wages, this would put the value of farm labor at about S.£ 11 per day on a 300-day basis for Lattakia and about twice that for Homs. This lends credibility to statements that wages are not high enough in farming to attract males, particularly in the coastal areas, and that the year-round return to farm labor is probably less than wages paid to workers during certain times of the year, particularly during harvest. One can appreciate that if this is true, farmers would consider wages they have to pay as very high and would tend to resent and resist paying wages on a daily basis to seasonal workers which are higher than they themselves earn on a year-round basis.



The above figures were based upon a farm labor force of 578,000 in 1976. If based instead upon the estimate that the number of farm workers was closer to 878,000 (due to the undercounting of females), the productivity figures presented here would be reduced by 34 percent. Thus the average gross value per worker would drop from S.f 10,000 to S.f 6,600 (for Lattakia, S.f 4,300 if the undercounting of females assumed under Hypothesis Number 2 were to be proportionate among Mohafazat).

One must also keep in mind that these measures of productivity are based on given price levels which presumably bear a reasonably close relationship to world prices. If higher prices were to be used, of course, productivity as measured by value would then increase. Any measure based on value is, therefore, subject to change as prices change and should never be used to measure productivity of dissimilar items.

The issue of productivity per worker will be reexamined in Section 7, where the possible short- and long-term policies toward solutions to the underemployment-labor shortage problem are discussed.

## 5. Potential Changes in Agricultural Manpower Availability

Projections for the future are very risky, even when based on the best of data, since many factors may change the present trends. In the case of agricultural manpower, moreover, it is uncertain what the past trends actually have been. In spite of these difficulties, and in recognition of the risks involved, projections of past trends will be presented in this chapter; the factors likely to change these projections will then be discussed.

### 5.1 Projections of Recent Past Trends in Farm Manpower

In Section 2, it was shown that statistics concerning the number of male farm workers seemed quite consistent from 1970 to 1976. Two hypotheses were suggested; the first was that the female labor force had declined at the same percentage as the male. This hypothesis was consistent with the concept that families left the farm work force together, as would happen if the farm families moved from the farms to urban areas. The second hypothesis was that the 1971-75 statistics showing there were approximately 300,000 females in the farm work force were correct and that the number did not decline over the period 1970-76. This hypothesis seems more consistent with the apparent lack of employment in other sectors for females, with the fact that mechanization has taken place more in tillage (a primarily male task), and with the fact that there are still large areas of wheat and barley as well as lentils and other crops harvested by hand (done by women and children).

The above calculations are presented only to show what would happen if the apparent trend were to continue; they should not be considered as predictions as there are too many unpredictable variables to be considered--among them deliberate government policy.

## 5.2 Rural Population Change

Population estimates made for mid-1976 indicate there were at that time 523,000 persons aged 10-14 living in rural areas, and that the rural population aged 5-9 consisted of 692,000 persons. This indicates that, not counting for migration or deaths, 523,000 youth would have now reached the 15-19 age group, and by 1986 another 692,000 rural youth would have reached this age level. Available data indicate that this age cohort has an even higher participation rate in the labor force than the 20-24 age group.

Using the 1976 labor force participation rates and making some allowances for deaths and retirement of the older elements of the work force, it would appear that the rural labor force could reach 1,181,000 by 1981 (an increase of 223,346 or about 23 percent) and by 1986 it could reach 1,480,449 (a further increase of about 308,000 workers or 25 percent over 1981). These calculations have disregarded deaths within the younger age groups, but did estimate 32,000 total deaths from 1976 to 1981 and 45,000 from 1981 to 1986 (see Appendix Table 64). If the death rate of 9.5 per thousand were to continue for these years and were proportionate for each group (not a very precise assumption), it would account for a probable reduction in the estimated rural labor force to 1,151,250 for 1981 and 1,457,500 for 1986.

Migration could, of course, reduce the numbers of the persons living in the rural areas and thus the rural labor force. Evidence indicates, however, that the rural population grew more rapidly from 1970 to 1976 than from 1960 to 1970, whereas the urban population growth pattern was the opposite. This would indicate either that the migration from rural to urban areas had slowed during the 1970-76 period, or that birth rates in the urban areas had become lower.

Syria's rural population grew at an annual rate of 2.15 percent from 1960-70 with an increase to 2.62 percent from 1970 to 1976. Urban population, which had grown at the annually compounded rate of 4.99 percent from 1960 to 1970, had grown only at the rate of 4.41 percent during the latter period (see Appendix Table 65). These data would seem to indicate that large numbers of young people will enter the rural labor force in future years.

Thus, there appear to be two somewhat contradictory patterns. One is a fairly rapid decrease in farm workers; the other is a rapid increase in the rural nonfarm labor force. This difference, if it does exist and is not merely the result of errors in the data, can only be explained by three possible developments.

The first possible explanation is the movement of rural residents to urban jobs. In view of the relatively short distance involved and the fact that Syria has more than one growth center, this could be a substantial movement (and is rumored to be so). Unfortunately, no data seem to be available to prove or disprove this hypothesis.

The second possibility is that a substantial increase in non-farm employment has occurred. Evidence from other countries indicates it is not unusual for as high as 40 percent of rural employment to be in nonfarm jobs, where rural towns are included in the definition of rural as is done in Syria. This percentage was apparently reached in Syria in 1970. According to the World Bank report referred to above, rural households spend much larger amounts for nonfood items as their incomes rise, with the income elasticity for such nonfood consumer items as well as for inputs to agriculture in excess of unity. This means that as farm income increases, the demand for goods and services of the nonfarm rural sector increases more rapidly percentage-wise than does income. The author, however, knows of no data indicating that this has taken place in Syria.

The third possibility is an increased out-migration of workers to other countries, but I do not know of any data to show that this has occurred.

Regardless of the cause, it does seem clear that there will be large increases in the rural labor force in the foreseeable future as the rural population continues to grow. Whether the apparent trend in reduction of the farm labor force will continue depends on many factors, some of which will be discussed in the next subsections.

### 5.3 Change in Farm Labor Force Characteristics

Some of the farm labor force characteristics which could change over time and thus affect the future size of Syria's farm labor force are education, mobility, status, and attitudinal changes.

Increased participation in education would mean that children would remain out of the farm labor force for a longer time, or more likely, would spend fewer hours working on the farm. This is particularly true for girls since the female labor force, according to the 1970 Census, consisted of an extremely large number of girls below 20 years of age. Depending upon the educational levels reached, further education may prepare more farm youth for nonfarm jobs and accelerate the migration of rural young people to urban areas.

While road building is often promoted as a means to assist the farmers in a particular area to sell their products and bring in inputs, it can also increase the mobility of the farm labor force in seeking either rural nonfarm or urban jobs.



According to the evidence presented in Section 2, the 1970 labor force consisted of about 30 percent unpaid family workers, 18 percent wage workers, 52 percent self-employed, and the remaining 10 percent employers. It would be desirable to know to what extent these proportions have been changing. One might expect that the reduction of the farm labor force would have reduced the number of wage workers and possibly unpaid family workers more than the number of self-employed, since the latter would tend to be less mobile and would have less reason to leave farming unless the amount of land they had was very small. In the case of unpaid family workers, however, inasmuch as they consist of young children, they are evidently being replaced quite rapidly.

One would expect, also, that with more education, young people would tend to be less likely to see farming as a way of life and more likely to seek employment elsewhere. Changing ideas about the role of women would also tend to induce many women to seek work elsewhere, as would increasing awareness of higher levels of living attained by nonfarm people.

#### 5.4 Economic Conditions

From the viewpoint of farm labor supply, the economic conditions outside farming are very important. No doubt such conditions have been important in reducing the farm labor force in the past. The opportunity cost for labor is important in determining the supply of farm labor, that is, in determining whether a person will work in farming or some other occupation. This is particularly true for hired farm workers and unpaid family workers since they are freer to make occupational choices than the established self-employed farmer. As long as wage rates in the nonfarm sector are sufficiently greater than in the farm sector, rural employment is continuous rather than seasonal, or other aspects of nonfarm employment are viewed as preferable to farming, workers will leave farming.

Judging by pay rate scales in farming as well as other evidence, off-farm opportunities have existed chiefly for men rather than women. The fact that so much barley and wheat are harvested by hand in the face of higher costs for hand harvesting if labor is paid at the rate of even S.f 10 per day seems to indicate that the opportunity cost for female labor is considered by either the females themselves, the heads of their households, or both to be either zero or very low. Otherwise they would not continue to harvest grain by hand. If opportunities for off-farm employment of women and girls were to increase, they would be more likely to leave farming; if not, they will probably continue to work on harvests.

Should economic conditions adversely affect the availability of nonfarm employment or lead to the loss of jobs by those presently holding them, the apparent decrease in farm employment might slow



down and possibly even reverse if the slump in economic activity is severe. While it is evident that actions would be taken to prevent this, world events can have effects beyond the influence of a single government.

### 5.5 Government Policies

One assumption of this study is that farmers react to economic incentives, even though social and cultural conditions also affect their actions. Governments can create, augment, or counteract economic incentives. For example, government agencies are not allowed to register an unemployed farmer and to assist with his obtaining a job unless they are officially assured by an authority in the home community that his farm is not large enough to allow him to earn a living. Such rules are evidently designed to prevent some farmers from earning off-farm money and leaving the farm. If governments require children to remain in school until a certain age, or offer them free education or stipends while attending school, they also affect the number of farm workers. Government policies, of course, can affect the farm labor force even more so in other ways, such as improvements in rural living and price supports.

The future supply of farm labor is closely linked to the demand for farm labor, since once individuals are forced to leave farming (because there is no job or land), they will generally not return to farming unless, as indicated above, drastic economic distress forces them to do so. Although possibilities of change in the requirements for farm labor will be discussed in Section 7, it is well to remember that the requirements for farm labor become a push factor if these requirements are reduced. That is, they tend to push farm workers out of farming, just as pull factors in other portions of the economy tend to attract them from farming. Therefore, I will return to the probable departures from the apparent farm labor force trend after discussing probable changes in labor requirements.

## 6. Potential Changes in Manpower Requirements

Up to this point, this chapter has been based upon tentative data and observations and analyses of both. The present section is more speculative and theoretical.

### 6.1 Mechanization

As can be inferred from evidence already discussed in this report, mechanization has had, and will continue to have, a tremendous effect upon labor requirements--particularly in wheat and barley. The Syrian government apparently has taken an active role in promoting the mechanization of grain production, particularly in seeding and harvesting. According to the budgets from which the labor requirements were obtained, hand cutting of grain, threshing with the use of animals, and winnowing and sifting

of grain cost S.£ 405-480 per hectare, while machine threshing cost S.£ 100 per hectare. Manual weeding was said to cost S.£ 70 per hectare compared to S.£ 30 per hectare for herbicide use. For the second tillage, the use of animal power cost S.£ 150 per hectare, while tractor tillage cost S.£ 50 per hectare. Planting cost S.£ 25 with tractors and S.£ 150 with animal power. Readyng the land for irrigation by hand methods cost S.£ 100, with machinery S.£ 60. Summing up these costs, we can see costs from S.£ 875-950 per hectare using animal and hand power and S.£ 250 with tractor power. Comparing this to the 1977 average wheat yield (about 800 kg./ha. at 75 piasters/kilo or S.£ 600 per hectare) puts these operating costs into perspective. It is clear that for anyone who pays for labor, there is a powerful economic incentive to mechanize grain production.

For the self-employed farmer with family help for which opportunity cost is very low, it may maximize family income to continue to harvest by hand. This is probably the major reason that much grain is still harvested by hand, though more straw is recovered by hand methods. With the premium price of forage in Syria, this is a second major reason for hand harvest.

While there appears to be quite an ample number of tractors and combines, in many instances farming operations other than plowing and combining are done to a large degree by hand or with animals. I have read of interest in and experimentation with windrowers for lentils, olive tree shakers to pick olives, airplanes to spray olives, cotton pickers and beet harvesters, but not for pre-plant and, particularly, post-plant tillage equipment.

Expansion of tractor usage to replace livestock tillage for planting and harvesting of crops would to a greater extent reduce labor requirements. However, there appears to be not much precedent in the use of nonhuman power for tillage after planting, particularly after the crop is growing. That is to say, animal power is not traditionally used for this purpose. If it were, conversion to tractor power could be done more quickly. However, the major reason that mechanization does not proceed more rapidly is the lack of economic opportunity for women in the farm work force who do much of the weeding and hoeing and the harvest work. Unless such opportunities occur or unless farming becomes more profitable (through higher yields or prices) so that it becomes desirable for farm families to trade leisure for slightly lower cash income, motives for further mechanization are lacking.

As I understand the sharecrop system (which I am told is fairly widespread in Syria), this could be another factor in favor of mechanization--if the landlord furnishes or pays for any portion of the production inputs other than land. Since, according to the suggested share arrangements, the proportion of the harvest's profits going to the landlord for tillage operations or for seed would probably increase as the cost of some other operation (harvest,

for example) decreases, there is an incentive for the landlord to press for this cost-reducing change. If the farmer and his family furnish the harvest labor, they may prefer to continue using hand methods as it would tend to maintain their share of income. Therefore, there is a conflict of interest between farmer and landlord, resolved on the basis of who has the most economic power in any given situation.

It is to be expected, then, that mechanization and the substitution of mechanical power for animal and human labor will continue reducing labor requirements. This, in turn, will affect the number of people in the farm work force as employees, self-employed, or both. The rapidity with which this will happen depends on whether farm labor, and particularly female labor, continues to be of low value. If the former continues to be of low value, mechanization may not occur very rapidly. Government policies again will influence the rate of change.

## 6.2 Farm Size

If mechanization becomes economically more desirable, there will be pressure to increase the farm size of individual farms. Since the cost of tractors and other equipment is very high, if borne by small farmers the cost per hectare is high. The hiring of tractors appears to be common in Syria, and seems to have been effective in keeping plowing costs quite reasonable but hours used per tractor quite high. Whether this will be the case if tractors are used for more farm operations remains to be seen. The tendency would seem to be toward more ownership by individual farmers as tractors are used for more farm operations. If this occurs, then there would tend to be pressure for larger farms, displacing more individual farmers, in order to spread tractor and equipment fixed costs over larger tracts of land.

On the other hand, if cooperative organizations are efficient, they could slow down such a development by making access to machinery at reasonable prices feasible. Government policy is also important in determining farm size. Information from the farm survey may be useful in better determining what farm size best accomplishes the goals of maximum food production, equity among farmers, and sustaining rural population numbers.

Without more concrete knowledge of the situation and government policies toward certain farm sizes, what I have been saying is mere speculation. I simply wish to point out that if mechanization is carried out by individual farmers, there is likely to be pressure to increase farm size, thus eliminating smaller producers. Should it be desired, this tendency can probably be slowed down or speeded up by deliberate government policy.



### 6.3 Individual Farm Organization

This refers to the mix of crop and livestock enterprises on the individual farm. Wherever there are complementarities in the use of resources, a mix of farm enterprises would seem to make best use of these resources. For example, if more labor is needed at certain times of the year than a farm family can provide but at other times of the year there is excess family labor under a one-crop system, growing two or more crops may make better use of the labor supply. Livestock enterprises likewise can make use of family labor otherwise unused. It has been calculated that on the average livestock farms need to be only 60 percent as large as farms without livestock in terms of land area to achieve the same income levels.

However, labor saving by specialization, lower machinery and equipment costs by spreading these costs over more land area, and efficiency in management (in that it may be more efficient to learn how to manage one enterprise rather than many) all point to specialization rather than diversification.

Labor on the individual farm may, however, be put to better use through logical diversification with labor demands spread out throughout the year rather than concentrated in a peak time period, as is true for one-crop farms. This is also the case at the Mohafaza level. In fact, the Mohafazat with a wider range of products showed less peak demand for labor in May and June compared to those Mohafazat with one crop completely dominating the farm economy, as shown in Section 4.

### 6.4 Land Area Availability Changes

The potential changes in land area will be discussed from two viewpoints: factors expanding cultivated land area, and factors reducing cultivated land area.

The principal addition to cultivated land area is through the extension of irrigation. If 435,000 ha. of additional land are added to the cultivated area of Syria, this could greatly increase the demand for farm workers. According to the labor requirements developed earlier (and assuming work for 150 days per year), it would take 20-30,000 farm workers if this land were planted for irrigated wheat and up to 300,000 workers for mostly nonmechanized sugar beet production. These figures are given not because the land would be exclusively planted for wheat or sugar beets, but to demonstrate the wide range in feasible requirements. Even with mechanization of sugar beet growing, about 40,000 workers would be required, and about 30 percent fewer for cotton production, if mechanized completely. From these figures it can be concluded that if the expansion of hectares is to be large for labor-intensive cotton and sugar beet production, at least partial mechanization will be needed.



The other factors affecting land availability are concerned with reduction in productive land. First, there is deterioration of rangeland, which has been investigated by others (see "Semi-Nomadic Systems of Production and the Delivery of Social Services," by Andrew Manzardo). If it is true that rangeland is slowly deteriorating, then to maintain the livestock numbers--particularly sheep and goats--substantial amounts of cropped land would have to be used. Roughage appears to be in very short supply in relation to livestock numbers. Secondly, there is land taken up or destroyed by city growth. One of the most apparent examples is the extension of Damascus into productive farmland in spite of the verticality of most recent construction. The same is likely to be occurring around other cities. Since this land area is farmed labor intensively, the effect such expansion has upon farm labor will be great--probably about one worker for each 2 ha., where production is entirely vegetables, and somewhat less with some mix of less labor-intensive crops. Road construction likewise reduces the amount of available cultivable land, but probably does not affect as high a proportion of highly productive land as does urban expansion. There are some reports of irrigation water pollution from factory chemicals which are already injuring certain crops in the Damascus area. Again, should such reports be substantiated, this could also sharply reduce labor requirements by decreasing the amount of land area being irrigated or by causing the land to go out of production.

On the whole, then, it is difficult to conclude what the numbers of persons engaged in agriculture would be by 1985 or by 2000. Mechanization, advanced to the point that it is today in the most mechanized agricultures in the world of 1979, whenever it is reached, would reduce labor requirements to about 100,000 workers. But I do not expect that this will be attained during the twentieth century in Syria.

My conclusion concerning the future of underemployment and labor shortages in Syrian agriculture is that both will continue to exist, perhaps even at any single particular period of the year in the same Mohafaza. This is due to some extent to the immobility of human resources in farming. If an individual is needed for even a few hours of work during a day or a few days during the week, he or she is not likely to seek work elsewhere. The distance that an individual will be willing to commute to work is probably less than distances he might have to travel even within a Mohafaza. As long as people are not too desperate to earn money, they would be reluctant to travel longer distances to locations where they would have to stay for weeks at a time within the vicinity of the particular crop for which they may be hired, unless adequate housing, sanitary facilities, etc., are made available. The apparent fact that most farm workers are women or children contributes further to the resistance to travel over long distances.

The fact of the biological nature of farming--that farming is a batch process rather than a continuous process such as most of

manufacturing--will dominate employment in farming. Except for certain types of livestock production, farm workers will always tend to be less employed during some parts of the year than others.

#### 6.5 Qualitative Changes in Farm Labor Force

In most of the discussion, the emphasis has been upon manpower requirements in terms of numbers rather than upon changes needed in characteristics of the farm work force itself.

One should not underestimate the ability of farmers to adjust to adverse farming conditions. The fact that they have been able to survive testifies to this. However, as conditions change and new opportunities become available, farmers will probably need more skills and training to take full advantage of these opportunities. Since changes in farming methods come about because of multiple sources of information, the increasing literacy of farmers will make it possible to reach them through written materials as well as by word of mouth.

Farmers' ability to maintain tractors and equipment has come a long way in the past ten years when, according to one publication, 40 percent of Syria's tractors were inoperative because of poor maintenance and lack of parts. There still is room for improvement, however.

Some training in farm management would be useful. Farmers have, no doubt, adjusted quite well to the use of the limited resources at hand, though there are some instances where resource allocation could be improved (particularly in regard to mechanization) in those instances where labor has a high cash or opportunity cost.

Where new crops are being promoted, training in both the culture of the crops and the use of any machinery different from that used for other crops is still necessary. One example is sugar beets where lack of familiarity with the crop seems to be retarding its development.

At this point in time, it is impossible to prescribe the detailed educational and skill needs of Syria's farm population, except that what is needed is better information about developments in farming. The Syrian government will need to exercise excellent judgment in deciding to accept or reject new developments. It will also need to become better able to articulate the needs of the large number of peasants outside the Peasant's Union, either as individuals or through some type of organization. As much of the farm work is done by females and since females, particularly in rural areas, are less literate than males, an obvious choice would be for literacy education for females.

There is some evidence that literacy may not be a great advantage for female employment in the countryside, however. For the

urban male work force, the percentage unemployed was lower (4.5 percent) than for their illiterate counterparts. For the urban female and the rural male work forces, the percentage unemployed is slightly greater for the literate than for the illiterate. However, for the female rural work force the percentage of unemployment (25 percent) is considerably greater for the literate than for the illiterate work force (5 percent). If this evidence reflects the general trends, it is little wonder that Syria's rural females are not motivated to obtain an education. This does not indicate that literacy education for females on farms may not be beneficial, but it does suggest that some restructuring is necessary for females if they are to take advantage of education as far as employment is concerned.

## 7. Alternative Policies

Various alternative and/or complementary policies are presented in this section. Changing conditions may make some more pertinent than others and some may be more in accord with the Syrian Government's objectives and overall goals.

This section is divided into two major sub-sections: short-range policies dealing with the problems of underemployment and labor shortages during the year and among Mohafazat, and longer-range considerations of farm labor productivity and earnings of farm people.

### 7.1 Short-Range Policies

This first sub-section is divided into five topics: (1) the possible reduction of peak seasonal needs; (2) spatial distribution of farm labor on a seasonal basis; (3) use of nonfarm labor in farming for peak labor needs; (4) improvement in farm management in order to be able to compete in labor markets; and (5) non-farm employment of farm labor on a seasonal basis.

7.1.1 Reduction of Peak Seasonal Needs: Seasonal needs for manpower are somewhat different in Syria on a crop-by-crop basis than in countries with more mechanized agriculture, where one would expect that planting and harvesting would be the periods of peak demand. In Syria, however, planting does not require as much labor as does weed control for row crops and vegetables. This means that there is a particularly heavy seasonal demand for labor during the growing season, especially for irrigated crops, vegetables, and tobacco when the period of labor needs for irrigation overlaps with the labor need for weeding and hoeing. Harvesting remains a period of heavy seasonal demand for labor; for wheat and barley as well as for the legume crops, it is the most important period of labor needs even when the crop harvest is nearly completely mechanized by the use of combines.



A first strategy, then, might be to reduce the peak labor needs. This could be done by creating a different crop combination on both a national and a regional basis. But probably any attempt to do this would result in poorer use of land resources. It would be disadvantageous to make such an attempt without an exhaustive study of overall productivity and efficient allocation of land resources to the production for which they are best suited.

A more fruitful approach would be to directly reduce the peak labor requirements for each affected crop. The most important and first approach should be to increase the productivity on a per land unit basis, particularly in the process of weed control, as it takes as much labor to control weeds for a low-yielding crop as for higher yielders, and perhaps more so. Therefore, whatever is necessary to promote higher yields of the various crops should be the first priority in attempting to reduce the peak seasonal needs for labor. More will be said about methods to do this under the section on longer-range policies.

A third approach is somewhat more obvious--the use of machinery and equipment. As mentioned, labor requirements for hoeing and weeding are high. There appears to be some use of herbicides in grain, but apparently it is not widespread. The Ministry of Labor has calculated savings of about S.£ 4 per hectare by using herbicides rather than hand weeding for wheat. Very probably the value of the yield increase would be larger than this, particularly if the chemicals were applied at the proper time. While the savings are not large either in time or cost, given the almost 2,000,000 ha. of wheat and barley, it would still result in a direct savings of S.£ 2,000,000, and at least 1 million man-days (2 million if the labor cost referred to female labor).

There is apparently little use of cultivators in Syria for weed control in row crops. The cost of cultivators is relatively small. They can save labor at a very crucial time, particularly for irrigated crops where labor demands for irrigation are likewise high. Thus, it would appear that investments in cultivators for tractors, or even possibly for livestock, would save considerable amounts of labor in cotton and sugar beet production, and possibly in vegetables. This alternative requires some adaptation of existing tractors, and perhaps more flexibility either in the production of more tractor sizes within Syria or in permission to import foreign-made tractors and/or equipment.

Harvesting is also a major outlet for farm labor. It is possible that the introduction of more grain combines, cotton pickers, and sugar beet machinery should have the third priority because of the large capital investments required and the subsequent loss in balance of payments as foreign labor in the production of this equipment is in effect substituted for Syrian agricultural labor. From the farm management viewpoint, the use of equipment may be justified, although landholding patterns and irrigation methods



may be obstacles to further mechanization (for further details, see Chapter III.) From the macroeconomic viewpoint of the society, a mechanization strategy must be closely examined for externality effects.

In spite of efforts to reduce the seasonality of labor demands, the nature of agriculture in Syria is such that some seasonality will always remain. Particularly for the industrial crops, this means that the need for hired labor during the harvest will continue.

#### 7.1.2 Spatial Distribution of Farm Labor on a Seasonal Basis:

At the present time, there is considerable relocation/migration movement of people to jobs in Syria, whether agricultural or otherwise. To date there has been little crop loss because of seasonal labor shortages. The biggest complaint comes from employers of farm labor who yearly have to pay higher wages for labor. Part of the reason for this increase is due to the rapid inflation which is evident in Syria. But farm wage rates for certain periods of the year and for certain tasks have apparently increased more rapidly than the rate of inflation. Statements have been made by employers and others that wage rates have increased approximately 5 to 30 piasters per kilo in the past five years for cotton picking, indicating a higher rate of increase than the 15-20 percent annual inflation rate said to have prevailed for the past several years.

There are several possible ways/means to help provide a more efficient and effective distribution of seasonal labor supplies, dependent to some extent on what is feasible within the framework of existing circumstances and institutions. First, the activities of existing employment agencies could be expanded to include placement of farm workers on a short-term basis, as well as a longer-term basis. At present, existing employment services do not register either farm employers or potential farm workers. This would, of course, necessitate more employees and cost for the employment services, but use could be made of the considerable expertise which has already been developed in at least some of the agencies.

Another possibility includes the creation of a separate government agency operating on a national basis to facilitate the recruitment and redistribution of itinerant farm laborers. This would benefit employers, but could also benefit landless laborers by facilitating more months of work per year. It is possible that other existing entities, such as the Peasant's Union or existing organizations of either employers or laborers, could facilitate this movement but this writer is unaware of any in existence except the Peasant's Union, which is closely tied to the Government. However, government supervision is essential to ensure fair wage rates and other conditions of employment, particularly housing for the labor force which must travel beyond commuting distance.

7.1.3 Use of Nonfarm Labor: No doubt, some use of nonfarm labor exists at present, such as the employment of students during summer vacation. College-level agricultural students could be another potential labor group, especially if done in such a way as to acquaint the students with farming, particularly since the data indicate that most college-level agricultural students are not children of farmers who work on their own fields.

Another possibility would be to introduce enough flexibility into urban employment to allow the urban labor force to work in farm crops for limited periods of time. Cuba, for example, has done this with a goal of acquainting white-collar workers with farm work, as well as to get the work done. If, as seems to be the case, farm harvest work is considered to be women's work and paid accordingly, this suggestion will meet with a great deal of opposition.

7.1.4 Improvement in Farm Management to Compete in Labor Markets: A basic reason why farmers complain about the high price of labor is that with given price levels, farms do not produce efficiently enough to allow farmers to pay the wages that the potential employees can earn elsewhere; or at least farmers think that they cannot and still earn from the land what they previously had earned. Greater efficiency in the use of land through higher yields is the first step toward better labor productivity. If wages continue to rise in spite of the productivity gains from higher production per land unit, then it will be necessary to introduce labor-saving equipment, starting with those that will give the highest return per Syrian pound invested. These investments appear most needed in cultivation equipment (as discussed elsewhere), in harvesting equipment, and in tillage equipment (tractors to replace oxen power used in addition to tractor plowing on much land area).

In other words, farm employers are competing both with other farmers and with nonfarm employers for the services of the prospective farm workers. They need to pay close attention to keeping gross income per land unit as high as possible and other costs as low as possible, consistent with optimum yield levels, in order to compete in the marketplace for available labor supplies. Thus, farmers would be able to attract people from other labor activities as well as people not in the labor force. The attraction for the former group, however, would probably be limited due to the temporary nature of farm employment.

7.1.5 Nonfarm Employment of Farm Labor on Seasonal Basis: Some attention should be directed to developing types of nonfarm employment that would be flexible enough to allow workers to take sizable blocks of time off for participating in farm work during peak seasons. This should take place in rural regions wherever possible. In this way, some of the workers who cannot work year-round and/or earn enough in farming would not be lost to farming entirely, but instead could have part-time employment in the urban centers.

One needs to face the fact, however, that even if all of these policies were put into effect in an efficient manner, the nature of agriculture is such that periods of underemployment and periods of relatively labor shortages throughout the year will continue to occur. The possibilities of increasing farm efficiency through leveling out these periods are limited. Of more importance is the efficiency of labor on farms during the periods in which it is employed, which is the subject of the remainder of this section.

## 7.2 Labor-Saving Technologies

Two labor-saving technologies are discussed: replacing of people by mechanical power and equipment, and increasing production per land or animal unit.

7.2.1 Changes in Mechanization: It is difficult to judge the exact state of mechanization in Syrian agriculture from available data, but it is obvious that a great number of tractors are in use. These tractors have been used primarily for plowing, with grain harvest also being highly mechanized in some areas. Apparently there is not a large amount of cultivation equipment being used to destroy weed seedlings and remove weeds after they have started. Most weeding is done by hand with little herbicide usage. Hoeing and weeding tend to consume more labor than harvest or planting in many cases.

Animal plowing, either alone or in combination with tractor plowing, still seems to be common. While the most common type of tractor pulls two bottoms and plows a hectare in 2-4 hours (depending on conditions), plowing with oxen requires 20-40 hours, and it is difficult to suppose it can do as good a job in most cases. As the cost of livestock plowing seems to have been at least S.£ 100 compared to about S.£ 40 with tractors, it is difficult to see why the farmers continue to use oxen. Two explanations seem logical, though there may be other reasons. First, most tractor plowing is hired and done during the slack period of the year. Therefore, one tractor can cover many hectares even though only pulling two bottoms, or at most three as is done in the eastern part of the country. At planting time, enough tractors may not be available to work the soil. Therefore, the farmer uses horses or oxen with a wooden plow to destroy weeds and prepare the seedbed. Secondly, the opportunity cost to the farmer may be close to zero if he has no readily available alternative use for his labor and owns oxen.

Perhaps during the time when mechanization is initiated, tractors are used for only a few tasks. Syria appears to be at this stage of development, at least in regard to row crops. The data show there were about 135,000 plows in Syria in 1977, of which 108,000 were old-type plows (indicating there were about 26,000 modern plows). At the rate of 3 hours per hectare, it would take 34 eight-hour days for 26,000 plows to turn over three-quarters of the 3,142,000 ha. of nonfruit cultivated land in Syria (in 1976).



This is not impossible, of course, particularly where much time is available between one harvest and the next planting. Where land is fallowed, it would appear to be even more feasible.

It seems, therefore, that if tractors are used for more purposes, particularly cultivation of row crops (that is, cultivation after planting), the use of oxen and horses will decrease except in mountainous areas where tractors cannot possibly operate. With 133,000 mules, horses, and oxen in Syria, it would seem that a quite sizable reduction in these numbers would probably occur. This reduction in the number of horses and mules could, of course, result in greater labor productivity from various sources. First, the land would be worked more rapidly by tractor, reducing man-hours per hectare. Second, farmers would no longer have to feed and care for the animals. It is difficult to estimate how much feed might be saved by having fewer draft animals, since apparently many animals subsist partly on feed that might otherwise be wasted.

7.2.2 Increasing Production per Land Unit: It is only by producing more per land unit that more crop production can be obtained except for additions to the area being cropped. The latter means is likely to produce a small increase except for some lands to be irrigated. If production per hectare is increased by 50 percent, this would increase total production by 50 percent, providing the same number of hectares are still cultivated. This would probably increase farm incomes by more than 50 percent.

However, increasing crop yields will probably not be very easy. Increasing the use of more productive varieties (such as Mexican wheat), more fertilization, better weed control, etc., can lead to some small gains. I will leave it to the soil scientists and agronomists to make a more precise evaluation of the productive capacity of Syrian soils given the vagaries of weather that exist.

One of the disadvantages to developmental aids such as Mexican wheat is that some people consider it to be a one-time solution rather than part of a continuous process of search and research for better varieties and cultural practices. Syria needs to have an indigenous research staff imaginatively and vigorously carrying out research on plants already grown in Syria and on plants not presently grown in Syria, such as sorghum and Sudan grass.

In other words, anything that would increase land productivity would also increase the productivity of labor. While the labor productivity gains are not as spectacular as those from labor-saving equipment, the gains are more solid, resulting in higher incomes for an existing rural population rather than reducing the number of farm workers and thus increasing the income of each as is true of labor-saving equipment. That is, these beneficial results occur if the bulk of the productivity gains do not go to a separate equipment-owning class.



7.2.3 Livestock Production per Animal Unit: The potential for increasing production per livestock unit is often greater than for crop production. In fact, during the period of rapid increase in crop yields in the U.S. and other parts of the world, livestock production per unit increased more rapidly on a percentage basis than did crop production. Increasing livestock production per unit is one area in which better breeding, feeding, and management can have profound effects not only in return to labor, by increasing labor efficiency, but also in increasing food production and perhaps upgrading diets (for a discussion of animal versus vegetable protein, see "Nutritional Status and the Planning of Nutrition Programs," by Dean Wilson). The emphasis here, however, is on labor productivity.

One example is milk production. For the year 1977, the record shows that 4,239,167 animals were milked and cared for along with large numbers of young stock and other nonmilk producing animals, resulting in 645,155 metric tons of milk. The number of animals milked had increased by 6,628 sheep, 50,831 goats, and 34,954 cows from 1976. However, reduction in per head annual production from 45.5 kg. to 30.6 kg. for goats, 127.9 kg. to 56.6 kg. for sheep, and 1,195 kg. to 1,147 kg. for cows resulted in a total reduction of 18,743 metric tons of milk from the 1976 level.

A practical goal for Syria to reach would be 10,000 lbs. or 4545 kg. per cow annually. At that level, exceeded by dairy production in many other countries, it will require only 142,000 cows to produce that amount of milk. The point is that improvements need to be made in production per animal in order to increase the productivity of labor, which is essential if the laborers are to earn a relatively good wage. At the same time, with the shortage of roughage in Syria feeding fewer animals more adequately would save greatly on roughage and somewhat on concentrates if production from fewer animals was increased.

Though dairy production was used as an example, the same principle is appropriate for other animals and poultry. Production of eggs was apparently 120 per hen for 1976, whereas feed would have been saved if production were closer to the 200 per hen level achieved in many other countries. If flocks were reduced correspondingly, this would also make the labor of those caring for the hens more productive. It is much more difficult to ascertain levels of production per animal unit for meat production, but no doubt roughage savings could also be made and labor productivity increased.

It must be recognized, of course, that the distribution of livestock at present has its advantages from the viewpoint of roughage utilization. Many animals scattered over large areas of grazing land, crop aftermath, etc., utilize roughage which would be wasted in a more concentrated animal agriculture. In spite of this, there appear to be possibilities of making better use of existing roughage sources in some areas through better

feeding of fewer animals. Yields of 30,000 kg./ha. of forage also seem encouraging.

One of the advantages of developing animal production on smaller farms is that techniques such as better breeding through artificial insemination, better feeding, and improvement of management techniques can be applied to farms of all sizes, in contrast to many farming practices which favor larger producers.

### 7.3 Labor-Intensive High-Value Production

Much of the agricultural work force of Syria is engaged in the production of vegetables and fruits. In fact, one can estimate that approximately one-half of Syria's farm labor is spent on these two areas, even though they occupy a much smaller proportion of land area. Labor requirements per hectare are very high for planting on crops such as onions; for weeding and hoeing they may be higher even than in harvesting. When irrigated, as they must be for satisfactory production in much of Syria, even more labor is required. It is said that growers find it difficult to make money even at wage rates of S.f 10-14 per day, though families continue to grow vegetables on their own land, often at labor returns that are less than the going wage. Even with high-value crops, labor intensity does not seem to yield satisfactory incomes at given (presumably world) vegetable and fruit prices. Attempts to increase labor productivity on the part of employers seem to consist largely of attempts to get workers to work harder. There may not be very effective ways to increase productivity per worker. Higher production levels per hectare would help, of course, but production already appears to be quite high. Mechanization is costly and not easily achieved, though there are some who would like to see such innovations as airplanes spraying olive orchards and tree shakers.

It does appear that the increased productivity route has been satisfactory in other countries. What has happened in advanced countries is that as wages in the nonfarm sector increase, the growers either must go out of business or must get the government to aid them. One action these governments have taken is to keep out foreign fruits and vegetables, allowing domestic prices to rise above world market prices. A second action has been to allow the importation of cheaper foreign labor to provide an additional work force and keep down domestic wages. Neither of these solutions is very satisfactory, the first in respect to the consumer, and the second in respect to the farm worker. Nonetheless, it would seem that a good case can be made for government intervention in the pricing of these types of crops, at least, the subject of the next sub-section.

### 7.4 Farm Subsidies

In much of this study, I have stressed the need for greater labor productivity. However, the only measure of labor productivity

among disparate products is by means of value produced per worker, as is determined by price as well as quantity produced. I have assumed that government-established prices are at or above world prices for those commodities, since a government interested in the welfare of its farm people would be unlikely to set them lower. If the government wished to increase labor productivity according to this method of calculation, all it would need to do is increase farm prices.

Thus, one goal of the government, to increase incomes of its farm people, could be accomplished by paying the farmers higher prices. In the short run, this is a simple transfer of income to farmers, but it does have some other implications. First, it increases income flow in the rural areas, helping the rural areas to increase in prosperity and jobs. Second, it may increase production by encouraging investments in fertilizer, seeds, and equipment. Third, it increases land prices since higher prices are distributed to other factors of production, with labor receiving the residuum.

Better results may be obtained by subsidizing inputs such as fertilizer, etc. In my own experience, this type of subsidy was more effective in increasing fertilizer use in the U.S. than it received credit for doing. It would, in effect, increase farmers' incomes even if it did not increase fertilizer use and simply reduced farm costs. In all likelihood such subsidies, however, would result in higher production with possibly lower product prices, which would result in higher incomes--at least in the short run. If the higher levels of production are allowed to depress the product prices, it could also lead to lower food prices to consumers than would otherwise be the case. At any rate, there would appear to be some benefits as well as costs to the economy as a whole.

The principal purpose of such subsidies would be to raise the incomes of farmers. It may be desirable to do so in spite of the fact that it constitutes a transfer from sectors which on the one hand may be more productive, but on the other hand may simply be able to command higher prices because of more market power. Judgment as to which is the case may be difficult.

#### 7.5 Nonfarm Rural Employment, Particularly for Females

Mechanization of Syrian agriculture will only occur when female labor is no longer available at low wage rates. To force mechanization would no doubt cause loss of farm family income from family workers, for the most part to owners of machinery. Only if there are other employment opportunities will harvesting labor become scarce enough to force the mechanization of harvest of grain and legume crops.



According to the available data, nonfarm rural employment seems to be increasing substantially. Research is needed to understand where this is occurring in order to encourage its further development. A World Bank publication suggests that examples in some Asian countries might be models on which to base such development, citing Taiwan as an example of decentralization of industry where people shifted occupations but not residences. Another example cited was Iran, where carpet-making and handicrafts were important rural nonfarm occupations.

The same publication stressed the necessity of government assistance to small-scale enterprises in rural areas (i.e., in infrastructure, banking and credit, trading services, research and technical assistance services, rural industrial estates, and employment policies of government organizations).

Since the World Bank appears to be interested in supporting this type of activity, it is suggested that this agency be utilized as a source of information and support for efforts to increase rural nonfarm employment, particularly in regard to what appears to be a very large proportion of the female farm labor force. Some effort is already underway in Syria in this regard under the Rural Development Program of the Ministry of Social Affairs and Labor (see "Delivery of Social Services to the Rural Population," by Harold Lemel).

In conclusion, and in reference to the three goals enunciated at the beginning of this paper, any increase in productivity per land unit or per animal unit would be beneficial in satisfying all three goals--increasing total farm product, increasing labor productivity of workers, and helping to keep people in the countryside. Improvements in labor productivity through further mechanization have both beneficial and detrimental effects, however. The most important beneficial effect is that it makes possible improvement in the incomes of farm workers or farmers by increasing their productivity. It has the detrimental effect of reducing the number of persons employed in farming and may contribute to the migration of people to urban areas. In order to counteract this detrimental effect of mechanization, increases in nonfarm rural employment are needed to offset the decreases in farm employment.

#### 8. Research Needs Relating to Farm Labor

This section contains some suggestions for future research on the current farm labor situation in order to enhance the effectiveness of future policy recommendations. The first portion is concerned with data generated by the farm survey being conducted in Syria at present; the second deals with more general research subjects.



## 8.1 Farm-Holders Survey Data Analysis

Two areas have been defined for an analysis--underemployment and labor shortages in farming, and the family farm concept.

8.1.1 Labor in Farming: The first suggestion is to make use of crop labor requirement data generated by the farm-holders survey together with numbers of individuals available for farm work within villages to make a more accurate and detailed analysis of underemployment and labor shortages on a smaller geographical basis than I have done in this study. It appears that either the labor requirements or the estimates of farm worker numbers were wrong, or that the Mohafaza was too large a geographical area to adequately measure labor shortages. Using data from the large number of farms (within an RPU) from which interviews will be obtained should insure considerable accuracy in the labor requirements and farm work force data. The smaller geographical unit of analysis should enable the researcher to pinpoint areas of labor shortage more accurately.

The second area of study would be the income approach to underemployment. The objective would be to identify the optimal farm size in several farming patterns below which unsatisfactory incomes would be attained and from which not only the farm children but also the farmer himself would seek either seasonal or permanent off-farm work.

8.1.2 The Family Farm in Syria: The family farm concept basically consists of the idea that the farm family should own the land it tills, that most of the farm work should be done by the farm family, and that the income of the farm family should be comparable to that earned in other occupations requiring similar levels of skill. The idea that the family should own the land it works contributes to the security of the farm family, to the feeling of dignity and worth of the individuals in the farm family, and to the sharing of wealth since the increase in land value accrues to the cultivator-owner. If most of the farm work is done by the farm family, it precludes the development of a farm laboring class, which would be economically and socially a lower class than the farm owners. By including adequate farm income levels in the definition, the concept excludes farms that are inadequate in size as measured by production level and net income possibilities.

The existence of this type of family farm has generally been thought to contribute to the creation of a large rural middle class. Under certain conditions, family-farm agriculture can induce high labor and land productivity and if controlled, a certain degree of economic equality and economic and political stability. The family farm concept is consistent with and closely related to the idea that as many viable farming opportunities as possible should be available to young people reaching working age.

Analysis of the farm survey data would attempt to identify the approximate farm size for various types of farming systems that would fit the above description of the ideal family farm. One classification of farming systems to use might be Vince Harrel's 14 farming systems. If appropriate farm crop and livestock combinations can be defined for the RPU's, then the ideal family farm could be described.

Two problems need to be solved if one is to use this approach. The first and most easily solved is what income level should be designated as adequate. One could take one-half or two-thirds that of fully employed workers in urban areas (presuming that living costs would still be lower in the country). Instead of using the same income level, as the study is repeated, the standard would be raised not only to keep up with inflation but also to keep up with the advancements in living standards.

The second problem is what size family should be projected for the ideal family farm, particularly in terms of the work force. Where hand labor is important, the amount of land that can be adequately handled by one family defines the farm size. Ideally then, the size of farm should be changed during different stages of the farm family life cycle. When the farmer is young and has no children or the children are small, the farm size would have to be small so that he could do the work himself. As the children get older, they help eventually as much as an adult; therefore, the farm would have to be larger to fully employ the farm family. It would seem that the first postulate--that the farm family should own the land they work--would need to be modified to say that they should own part of the land they work. If enough was owned to occupy the time of one individual male, then adjustments in size of farm by renting land could be made as the farm family grew in labor capability and by eliminating rentals as the on-farm family size decreased. Alternatively, in some regions animal enterprises could be yet another method of adjusting farm size of family size, but more needs to be known about the cultural setting and individual circumstances to postulate a preferred pattern along these lines.

One of the basic assumptions of this analysis is that there is some farm size at which farm incomes can reach a satisfactory level with all the work done by only the farm family. There may be types of production in which this is not possible with existing mechanization levels and prices, or even at levels of mechanization and prices conceivably attainable. If this is true, of course, the ideal of the family farm would be impossible to attain. But it is important to determine the feasibility of family farms given Syrian agricultural conditions and present landholding patterns.

## 8.2 Analysis of Nonfarm Rural Employment Possibilities

If it is essential to improve labor productivity in farming to a greater extent than can be done only through increases in total

farm production, as appears to be the case, it will be necessary to reduce the number of workers in farming. Thus each worker will be producing a greater proportion of the whole. On the other hand, in order to improve farm income by increasing total output, individual income can only be increased by reducing the number of total workers. This assumes that the State will act to prevent unequal distribution of productivity gains.

If the number of farm workers is to decrease while the rural population increases, more workers must seek work elsewhere, either in urban employment or nonfarm rural employment. If it is a goal to slow down growth of urban areas, then it is imperative to give importance to the development of nonfarm rural employment possibilities.

It is necessary to know what activities are being carried on in this sector in Syria, and what obstacles there may be to their expansion. Only by understanding the situation which exists and the successes and failures of present attempts to promote this type of employment can a comprehensive strategy for the promotion of non-farm rural economic activities be formulated and implemented.

### 8.3 Analysis of Nonfarm, Agriculturally Related Employment

Closely related to the nonfarm employment question (and partially overlapping it) is the question of the relationship between declines in farm employment and increases in nonfarm by farm related employment. When farmers substitute inputs produced off-farm such as fertilizer, improved seeds (though it may be questionable whether this should be classified as a farm activity), farm chemicals and machinery for farm-produced inputs, it causes an expansion of jobs in agriculturally related areas. Likewise, as more of the population becomes urban, marketing services become more important; more of the farm product is sold off-farm, food travels longer distances from the farm to the consumer, and more processing of farm products must occur.

The 1970 Census lists 82,000 persons who are involved in occupations that process or market mostly agricultural products. This does not include restaurants which hire another 12,000. While about 41 percent of employed persons in Syria are farm workers, only 2.5 percent work in food retailing. These percentages probably reflect small farm size in Syria and lower productivity per worker in the farm marketing sector since it would seem that a smaller proportion of total production must be marketed.

There seems to be no available estimates of growth of the farm input industry in Syria. While this lack of information has scarcely been a matter of concern in the U.S. (except for educators interested in job opportunities for their students), it would appear to be of greater concern to a planned economy such as Syria's.



#### 8.4 Share Rental System and Machinery Ownership

It would seem that the system of share renting would tend to force an increase in mechanization. The clearest example of this is wheat production in Al-Rakka, where the land is prepared for irrigation by hand, some animal tillage is used, and the crop is cut by hand and threshed by hand methods. The person who supplied or paid for the first tillage with a tractor would receive 3.5 percent of the crop as his return on the cost of S.f 50 per hectare, whereas if all of these tasks were performed by mechanical means, the tractor tillage would be worth 7.1 percent of the crop. It would appear, therefore, that if the landowner furnished some inputs besides land he would be motivated to mechanize the entire operation. The farm family might feel differently since if it performed the various tasks by hand it would receive higher proportions of the crop. With machine harvesting (combining), 14 percent of the crop share accrues to the individual who paid for the harvesting. In contrast, hand harvesting takes 28 percent of the crop when done entirely by hand. It would seem, therefore, to make a great deal of difference who furnished the various inputs as to whether mechanization would proceed rapidly or more slowly. Research should attempt to describe these relationships.

#### 8.5 Labor Conditions

If it is found desirable to continue hand labor in cotton and sugar beet production, there should be a study on the need to bring workers in from beyond daily commuting distances. If it is found necessary to do so, then there need to be regulations concerning the conditions of employment, particularly in the areas of housing, sanitation, and health. These investments, necessary for the protection of the workers, may well sway growers in the direction of labor-saving equipment. If this means the loss of some employment in agriculture, it would probably be preferable to the creation of a migratory labor class.

The apparently low labor force participation on the part of both males and females in Syria may be partially, at least, a matter of errors or differences in the method of determining labor force participation, i.e., the omission in most surveys of farm women who participate during part of the year. The published data show that Syria has from 1 to 1.5 million fewer persons in the work force than if participation rates were as high as in other countries, with the larger proportion of these omitted people being females.

There has been some recognition of the problematic lack of women's participation in economic activities, as evidenced by a paper by Safadi in 1969 which emphasized its importance. As mentioned earlier, the key to higher labor productivity in agriculture is the provision of alternatives for the thousands of females who still do hand labor in farming.



I propose, therefore, that the manpower planners hire a woman who is cognizant of both the cultural and the social setting of Syria and is well-informed about the changing role of women in other societies to study the situation and develop proposals to bring farm women into the mainstream of economic life in Syria. Only with alternative opportunities will sufficient farm labor leave agriculture to force more modern methods which are more productive in returns to labor. Should further mechanization take place without these opportunities, it would cause hardship on the displaced workers.

List of Appendix Tables

	<u>Page</u>
<u>TABLE:</u>	
1 Rural Population by Mohafazat and as % of Mohafazat Population, 1970	57
2 Rural Population by Mohafazat and as % of Mohafazat Population, 1976; and Change from 1970	58
3 Rural Population Increase from 1970 to 1976 and Percent Change by Mohafazat	59
4 Sex Ratios of Rural and Urban Population by Age Groups, 1970 and 1976	60
5 Percent Rural by Age Groups 1970 and 1976	61
6 Net Migration from Rural Areas to Urban Centers, 1976	62
7 Age and Sex Specific Labor Participation Rates in Syria Compared to Two Groups of Countries: 1970 for Syria, 1965 for Other Countries	63
8 Comparison of Rural Labor Force Size to Total Labor Force Size, 1970-76	64
9 Labor Force as a Proportion of Able-Bodied Individuals over 10 Years of Age, 1976 and 1977	65
10 Rural Labor Force as a Percentage of Rural Manpower by Sex and Mohafaza, 1976	66
11 Number of Workers Employed in Farming with Year-to-Year Percentage Changes, 1970-76	67
12 Farm Labor Force and Male Farm Labor Force as Percentage of Total Labor Force, 1970-76	68
13 Farm Labor Work Force by Mohafazat, 1970 and 1976	69
14 Changes in Farm Labor Force from 1970 to 1976, by Mohafazat	70
15 Average Daily Wages of Selected Building Workers in the Private Sector, 1975-76, by Mohafaza	71
16 Percent Change in Average of Lowest and Highest Average Daily Wages for Construction Workers, 1975-76, Compared to Changes in Farm Labor Force by Mohafaza, 1970-76	72
17 Classification of Agricultural, Animal Husbandry, Forestry Workers, Fishermen, and Hunters by Mohafazat, 1970	73
18 Classification of Agricultural, Animal Husbandry, Forestry Workers, Fishermen, and Hunters by Mohafazat, Percentage in Each Category, 1970	74
19 Employment Status of the Agricultural Work Force by Mohafazat, 1970	75

<u>TABLE:</u>	<u>Page</u>
20 Employment Status of the Agricultural Work Force by Mohafazat, Percentage in Each Category, 1970	76
21 Literacy of the Agricultural Work Force by Type of Worker by Mohafazat, 1970	77
22 Percent Literate of Total Labor Force by Mohafazat and Sex, 1970 and 1976	78
23 Proportion of Selected Age Groups in the Active Agricultural and Non-Agricultural Labor Forces by Sex, 1970	79
24 Farm Labor Force Compared to the Non-Farm Labor Force by Age Groups and Mohafazat, 1970	80
25 Farm Labor Force Compared to Non-Farm Labor Force by Age Groups and Mohafaza, Percentages in Each Age Group, 1970	81
26 Area Planted to 22 Selected Major Crops Considered in Labor Requirement Analysis, 1977 Data	82-85
27 Labor Requirements for Irrigated Wheat, per Hectare	86
28 Labor Requirements for Non-Irrigated Barley, per Hectare	87
29 Mechanization of Wheat and Barley Harvest	88
30 Labor Requirements for Irrigated Potatoes, per Hectare	89
31 " " " " Eggplant, " "	89
32 " " " Chickpeas, " "	90
33 " " " Lentils, " "	90
34 " " " Vetches, " "	90
35 " " " Irrigated Sugarbeet, " "	91
36 " " " Muskmelon, " "	92
37 " " " Irrigated Cucumbers, " "	92
38 " " " Watermelon, " "	92
39 " " " Non-Irrigated Tobacco, per Hectare	93
40 " " " Tomatoes, " "	93
41 " " " Irrigated Dry Onions, " "	94
42 " " " Squash, " "	94
43 " " " Apples, " "	95
44 " " " Apricots, " "	95
45 " " " Olives, " "	96
46 " " " Grapes, " "	96
47 " " " Irrigated Cotton, " "	97
48 " " " Sesame, " "	97

<u>TABLE:</u>	<u>Page</u>
49 Labor Requirements for Peanuts, per Hectare	97
50 Labor Requirements for the Major Producing Areas for 22 Selected Major Crops by Mohafaza in Man-Days, 1976-1977	98-99
51 Estimation of Labor Requirements for Omitted Acreage, Livestock Production and Total in Man-Days, 1976-1977	100-101
52 Man-Days Required for Total Acreage of 22 Selected Major Crops, 1976-1977	102
53 Number of Workers Required by Month and by Mohafaza in 22 Selected Crops Only, 1976-1977	103
54 Total Number of Workers Required by Month and by Mohafaza, 1976-1977	104
55 Average Number of Workers Required; Percentage of Farm Labor Force by Mohafaza, 1976-1977	105
56 Percentages Unemployed in Urban and Rural Labor Force, by Mohafaza, 1976	106
57 Number and Percentage of Farmers Unemployed by Mohafaza, 1976-1977	107
58 Daily Minimum Wage for Agricultural Workers in Mohafaza According to Agricultural Operations, 1977	108
59 Hourly Wage Rates in Various Mohafazat and by Task	109
60 Land Area Planted in 1973 Compared to Number of Agricul- tural Workers in 1970, by Mohafazat	110
61 Cultivated Area per Farm Worker by Mohafaza, 1976	111
62 Value of Production per Hectare, by Mohafaza, 1977	112
63 Value of Production Compared to Number of Workers by Mohafaza, 1977	113
64 Projected Increases in Rural Labor Force 1976-81 and 1981-86	114
65 Growth in Rural and Urban Population 1960-70 and 1970-76	115
66 Number and Percentage Unemployment of the Labor Force, Urban and Rural, by Educational Status, 1977	115



APPENDIX TABLE 1: RURAL POPULATION BY MOHAFAZAT AND AS PERCENT OF Total  
MOHAFAZA POPULATION, 1970

<u>MOHAFAZAT</u>	<u>RURAL POPULATION</u>	<u>Percent RURAL OF TOTAL POPULATION</u>
DAMASCUS	438,974	30.3 %
ALEPPO	608,367	46.2
HOMS	292,561	53.6
HAMA	339,989	75.8
LATTAKIA	240,518	61.7
DEIR EZ ZOR	203,722	69.6
IDLEB	298,731	77.8
AL HASAKEH	372,621	79.5
AL RAKKA	204,450	83.9
AL SWEIDA	100,944	72.3
DAR'A	199,288	85.7
TARTOUS	246,859	81.7
QUNEITRA	16,490	100.
TOTAL	3,563,514	56.5 %

SOURCE: STATISTICAL ABSTRACT, 1977

APPENDIX TABLE 2: RURAL POPULATION BY MOHAFAZAT AND, AS PERCENT OF  
MOHAFAZAT POPULATION, 1976 AND CHANGE FROM 1970

<u>MOHAFAZAT</u>	<u>RURAL POPULATION</u>	<u>PERCENT RURAL OF</u> <u>TOTAL POPULATION</u>	<u>CHANGE IN PERCENT</u> <u>RURAL</u>
DAMASCUS	531,659	28.7 %	-0.6 %
ALEPPO	666,023	41.5	-4.7
HOMS	337,759	51.5	-2.1
HAMA	412,503	65.8	-10.0
LATTAKIA	300,323	60.8	-0.9
DEIREZ ZOR	230,519	68.4	-1.2
IDLEB	378,710	78.3	+0.6
AL HASAKEH	419,830	77.8	-1.7
AL RAKKA	209,279	71.0	-12.9
AL SWEIDA	113, 378	73.6	+1.3
DAR'A	232,126	84.1	-1.6
TARTOUS	310,848	81.0	-0.7
QUNEITRA	18,398	100.	0
TOTAL	4,161,355	53.9 %	-2.6

SOURCE: STATISTICAL ABSTRACT, 1977

APPENDIX TABLE 3: RURAL POPULATION INCREASE FROM 1970 TO 1976 AND PERCENT  
CHANGE BY MOHAFAZAT

<u>MOHOFAZAT</u>	<u>RURAL POPULATION INCREASE</u>	<u>INCREASE<sup>24</sup> % OF 1970 RURAL POPULATION</u>
DAMASCUS	92,685	21.1 %
ALEPPO	57,656	9.5
HOMS	45,198	15.4
HAMA	72,514	21.3
LATTAKIA	59,805	24.9
DEIR EZ ZOR	26,797	13.2
IDLEB	79,979	26.8
AL HASAKEH	47,209	12.7
AL RAKKA	4,829	2.4
AL SWEIDA	12,434	12.3
DAR'A	32,838	16.5
TARTOUS	63,989	25.9
QUNEITRA	1,908	11.6
TOTAL	597,841	16.8 %

SOURCE: STATISTICAL ABSTRACT, 1977

APPENDIX TABLE 4

SEX RATIOS OF RURAL AND URBAN POPULATION BY AGE GROUPS

1970 and 1976

	RURAL		URBAN	
	1970	1976	1970	1976
Less than 1 year	109.5	108.3	106.9	108.3
1-4	106.1	105.9	106.8	106.5
5-9	109.0	108.4	107.1	107.3
10-14	113.4	113.4	108.8	108.6
15-19	100.7	103.1	108.1	111.0
20-24	110.1	105.9	105.1	101.4
25-29	083.9	85.8	103.0	107.0
30-34	081.4	80.7	108.5	109.1
35-39	089.2	84.6	113.7	111.7
40-44	104.1	100.0	119.1	115.4
45-49	106.8	104.6	117.1	116.9
50-54	104.6	114.8	106.5	97.7
55-59	108.9	102.8	111.1	105.5
60-64	102.1	105.2	88.1	93.5
65 & over	107.3	105.2	90.6	92.9
TOTAL	103.8	103.6	107.1	107.1

Statistical Abstract 1977-- Midyear estimates.



APPENDIX TABLE 5

PERCENT RURAL BY AGE GROUP 1970 and 1976

	<u>Percent Rural 1970</u>			<u>Percent Rural 1976</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Less than 1 year	58.5	57.7	58.1	54.5	54.5	54.5
1-4	59.2	59.4	59.3	55.8	55.9	55.8
5-9	57.7	57.3	57.5	54.0	53.7	53.9
10-14	56.4	55.4	56.0	52.6	51.5	52.0
15-19	54.4	56.2	55.3	50.6	52.5	51.5
20-24	54.2	53.1	53.7	50.2	49.1	49.6
25-29	48.8	54.2	51.6	44.5	50.0	47.3
30-34	48.4	55.5	52.0	44.0	51.5	47.8
35-39	51.5	57.5	54.6	47.8	53.3	50.5
40-44	53.3	56.6	54.8	49.4	53.0	51.1
45-49	55.8	58.0	56.9	51.9	54.7	53.3
50-54	59.1	59.5	59.3	55.7	51.6	53.7
55-59	55.8	56.2	56.0	51.9	52.6	52.3
60-64	62.0	58.5	60.2	58.0	55.1	56.5
65 & over	64.6	60.7	62.6	60.5	57.5	59.0
TOTAL	56.1	56.9	56.5	52.2	53.1	52.7

Statistical Abstract 1977- Midyear estimates

APPENDIX TABLE 6: NET MIGRATION FROM RURAL AREAS TO URBAN CENTERS, 1976

MOHAFAZA OF ORIGIN	SAME MOHAFAZA		DIFFERENT MOHAFAZAT		TOTAL
	CENTER	OTHER URBAN	CENTER	OTHER URBAN	
DAMASCUS	1048	- 38	- 151	- 3	856
HOMS	440	73	433	46	992
HAMA	34	15	437	12	498
TARTOUS	94	51	- 2	- 41	102
LATTAKIA	462	30	386	- 1	877
IDLEB	63	- 13	595	43	688
ALEPPO	2116	293	409	319	3137
RAQQA	59	13	- 17	5	60
DEIR EZ ZOR	10	41	76	51	178
HASSAKA	239	535	124	21	919
SWEIDA	173	40	301	- 14	500
DAR'A	87	26	1198	62	1373
QUNEITRA	- 1	-	2553	86	2638
TOTAL	4824	1,066	6,342	586	12,818

SOURCE: TABLE FURNISHED BY CENTRAL BUREAU OF STATISTICS, unweighted sample Census data. Since this data is unweighted, it indicates the direction of migration but not actual extent of migration.

APPENDIX TABLE 7: AGE AND SEX SPECIFIC LABOR PARTICIPATION RATES; SYRIA COMPARED TO TWO GROUPS OF COUNTRIES. 1970 FOR SYRIA, 1965 FOR OTHER COUNTRIES.

	LABOR PARTICIPATION RATES			
	MALE		FEMALE	
	LESS DEVELOPED COUNTRIES	MORE DEVELOPED COUNTRIES	LESS DEVELOPED COUNTRIES	MORE DEVELOPED COUNTRIES
0 - 14	6.5 %	1.3 %	4.0 %	0.8 %
15 - 24	78.1	70.2	36.9	47.8
25 - 54	96.3	96.1	40.1	40.3
55 - 64	86.3	82.6	29.2	30.1
65 +	57.5	30.0	14.5	9.2
TOTAL	53.2 %	58.3 %	22.9 %	26.8 %
				5.3 %

SOURCES: STATISTICAL ABSTRACT 1977, SYRIA, DAVID TURNHAM.

THE EMPLOYMENT PROBLEM IN LESS DEVELOPED COUNTRIES: A REVIEW OF EVIDENCE

APPENDIX TABLE 8: COMPARISON OF RURAL LABOR FORCE SIZE TO TOTAL LABOR FORCE SIZE, 1970-1976

<u>YEAR</u>	<u>TOTAL LABOR FORCE</u>	<u>RURAL LABOR FORCE</u>	<u>RURAL LABOR FORCE AS PERCENT OF TOTAL LABOR FORCE</u>
1970	1,570,776	907,109	57.7 %
1971	1,645,721	958,486	58.2
1972	1,715,072	1,035,460	60.4
1973	1,688,564	1,038,010	61.5
1974	1,718,553	1,044,702	60.8
1975	1,838,948	1,130,780	61.5
1976	1,827,924	957,956	52.4
1977	1,994,759	1,081,473	54.2

SOURCES: DATA FOR 1970, POPULATION CENSUS OF 1970; FOR 1976, SAMPLE POPULATION CENSUS; AND FOR 1971-75 AND 1977, Statistical Bulletin of the Ministry of Labor and Social Affairs, 1971-1975 and 1977



APPENDIX TABLE 9: LABOR FORCE AS A PROPORTION OF Able-Bodied Individuals  
Over 10 Years of Age, 1976 and 1977

	<u>RURAL</u>		<u>URBAN</u>	
	<u>1976</u>	<u>1977</u>	<u>1976</u>	<u>1977</u>
<u>MALE</u>	62.1 %	62.4 %	62.2 %	58.6 %
<u>FEMALE</u>	6.7 %	19.1 %	6.9 %	8.1 %
<u>TOTAL</u>	35.4 %	40.8 %	35.5 %	34.3 %

SOURCE: STATISTICAL ABSTRACT 1977 AND ANNUAL STATISTICAL BULLETIN OF  
MINISTRY OF SOCIAL AFFAIRS AND LABOR, 1976

APPENDIX TABLE 10: RURAL LABOR FORCE AS A PERCENT OF RURAL MANPOWER BY  
SEX AND MOHAFAZA, SEPTEMBER 22, 1976

	<u>MALE</u>	<u>FEMALE</u>
DAMASCUS	64.5 %	4.0 %
ALEPPO	63.9	4.6
HOMS	58.3	10.5
HAMA	60.7	16.1
LATTAKIA	55.7	11.0
DEIR EZ ZOR	64.6	6.7
IDLEB	61.0	4.9
HASSAKEH	69.4	6.1
RAKKA	72.7	3.3
SWEIDA	58.3	3.1
DAR'A	56.7	1.8
TARTOUS	55.0	4.8
QUENITRA	60.5	1.9
TOTAL	62.1 %	6.7 %

SOURCE: STATISTICAL ABSTRACT, 1977

APPENDIX TABLE 11: NUMBER OF WORKERS EMPLOYED IN FARMING WITH YEAR-TO-YEAR PERCENTAGE CHANGES,  
1970 - 1976.

<u>YEAR</u>	<u>TOTAL</u>		<u>FEMALE</u>		<u>MALE</u>	
	<u>NUMBER</u>	<u>PERCENT OF YEAR BEFORE</u>	<u>NUMBER</u>	<u>PERCENT OF YEAR BEFORE</u>	<u>NUMBER</u>	<u>PERCENT OF YEAR BEFORE</u>
1970	748,009	-	106,712	-	641,297	-
1971	844,269	118.2 %	245,751	230.3 %	638,518	99.6 %
1972	925,345	104.6	289,397	117.8	635,865	99.6
1973	857,943	92.7	280,031	96.8	577,612	87.7
1974	877,811	102.3	220,999	78.9	656,882	113.7
1975	896,517	102.1	309,027	139.8	587,496	89.9
1976	578,268	64.5	62,512	20.2	515,756	87.8

SOURCES: Annual Statistical Abstract, 1977; and Annual Statistical Bulletin of the Ministry of Labor and Social Affairs, 1971-75.

APPENDIX TABLE 12: FARM LABOR FORCE AND MALE FARM LABOR FORCE AS  
PERCENTAGE OF TOTAL LABOR FORCE, 1970 - 1976.

<u>YEAR</u>	<u>FARM LABOR FORCE</u>	<u>MALE FARM LABOR FORCE</u>
1970	47.6 %	40.8 %
1971	53.1	38.8
1972	53.9	37.1
1973	50.8	34.2
1974	51.0	38.2
1975	48.7	31.9
1976	31.3	28.2

Source: Statistical Abstract, 1977 and Annual Statistical  
Bulletin of the Ministry of Labor and Social Affairs  
1971-75.



APPENDIX TABLE 13: FARM LABOR WORK FORCE BY MOHAFAZA, 1970 AND 1976

<u>MOHAFAZA</u>	<u>Farm WORKERS</u>		<u>PERCENT BY MOHAFAZA</u>	
	<u>1970</u>	<u>1976</u>	<u>1970</u>	<u>1976</u>
DAMASCUS CITY	11,975	7,252	1.6 %	1.3 %
DAMASCUS	57,216	41,600	7.6	7.2
ALEPPO	152,108	97,615	20.2	16.9
HOMS	57,282	42,808	7.6	7.4
HAMA	87,813	80,163	11.7	13.9
LATTAKIA	51,968	44,269	6.9	1.7
DEIR EZ ZOR	49,095 *	45,643	6.5	7.9
IDLEB	55,120	48,310	7.3	8.4
AL HASAKEH	81,802	63,595	10.9	11.0
AL RAKKA	56,769	45,659	7.6	7.9
AL SWEIDA	18,182	10,819	2.4	1.9
DAR'A	26,694	16,833	3.6	2.9
TARTOUS	42,914	31,195	5.7	5.4
QUNEITRA	<u>2,581</u> *	<u>2,507</u>	<u>0.3</u>	<u>0.4</u>
TOTAL	751,519	578,268	99.9 %	100.0 %

SOURCE: Statistical Bulletin 1977, and Population Sample Census, 1976, Central Bureau of Statistics, 1977.

APPENDIX TABLE 14: CHANGES IN FARM LABOR FORCE FROM 1970 TO 1976 BY  
MOHAFAZA

	<u>1970</u>	<u>1976</u>	<u>DECREASE</u> <u>NUMBER</u>	<u>PERCENT</u>
DAMASCUS CITY	11,975	7,252	4,723	39.4 %
DAMASCUS	57,216	41,600	15,616	27.3
HOMS	57,282	42,808	14,474	25.3
HAMA	87,813	80,163	7,650	8.7
TARTOUS	42,914	31,195	11,719	27.3
LATTAKIA	51,968	44,269	7,700	14.8
IDLEB	55,120	48,310	6,810	12.4
ALEPPO	152,108	97,615	54,493	35.8
RAKKA	57,769	45,659	11,110	19.6
DEIR EZ ZOR	49,095	45,643	3,452	7.0
HASSAKEH	81,802	63,595	18,207	22.3
SWEIDA	18,182	10,819	7,403	40.7
DAR'A	26,694	16,833	9,861	36.9
QUNEITRA	2,584	2,507	77	3.0
TOTAL	<u>751,519</u>	<u>578,268</u>	<u>173,295</u>	<u>23.1 %</u>

SOURCE: Statistical Abstract 1977 and Population Sample Census 1976,  
Central Bureau of Statistics, 1977.

APPENDIX TABLE 15: AVERAGE DAILY WAGES FOR SELECTED BUILDING WORKERS<sup>1</sup> IN THE PRIVATE SECTOR 1975, 1976 BY MOHAFAZA

<u>MOHAFAZA</u>	<u>HIGHEST WAGE GROUP</u>		<u>LOWEST WAGE GROUP</u>		<u>AVERAGE OF BOTH GROUPS</u>	
	<u>1975</u>	<u>1976</u>	<u>1975</u>	<u>1976</u>	<u>1975</u>	<u>1976</u>
DAMASCUS	37	73	15	37	26	55
ALEPPO	32	47	17	21	24	34
HOMS	52	-	15	15	15	15
HAMA	42	47	10	10	26	28
IDLEB	50	42	17	20	33	26
LATTAKIA	30	42	17	19	23	30
DEIR EZ ZOR	30	50	12	18	21	34
AL RAKKA	50	45	12	15	31	30
HASSAKAH	38	49	11	11	24	30
TARTOUS	40	47	20	19	30	33
SWEIDA	25	35	-	10	-	22
DAR'A	25	40	10	10	17	25

<sup>1</sup> FOR THE MOST PART THE TWO GROUPS ARE CEMENT CARPENTERS AND ORDINARY WORKMEN.

SOURCE: ANNUAL STATISTICAL BULLETIN OF MINISTRY OF SOCIAL AFFAIRS AND LABOR, 1976

APPENDIX TABLE 16: PERCENTAGE CHANGE IN AVERAGE OF LOWEST AND HIGHEST AVERAGE DAILY WAGES FOR CONSTRUCTION WORKERS, 1975 - 1976 COMPARED TO CHANGES IN FARM LABOR FORCE BY MOHAFAZA, 1970 - 1976.

<u>MOHAFAZA</u>	<u>PERCENT Decrease in</u> <u>FARM LABOR FORCE</u>	<u>PERCENT CHANGE IN Con-</u> <u>struction Wage</u>
SWEIDA	40 %	40 % <sup>1</sup>
ALEPPO	36	42
DAR'A	35	47
DAMASCUS	29	111
TARTOUS	27	10
HOMS	24 <sup>2</sup>	0
HASSAKEH	22	25
RAKKA	19.5	- .03
LATTAKIA	14.7	30
IDLEB	12.3	- 22
HAMA	8.7	8
DEIR EZ ZOR	7.0	62

<sup>1</sup> BASED ONLY ON HIGHEST WAGE SINCE LOWEST WAS NOT REPORTED FOR 1975

<sup>2</sup> BASED ONLY ON LOWEST WAGE SINCE HIGHEST WAS NOT REPORTED FOR 1975 OR 1976.

Sources: Annual Statistical Bulletin of Ministry of Social Affairs and Labor 1976, and Statistical Abstract 1977.



APPENDIX TABLE 17: CLASSIFICATION OF AGRICULTURAL, ANIMAL HUSBANDRY, FORESTRY WORKERS, FISHERMEN, HUNTERS BY MOHAFAZAT, 1970.

<u>MOHAFAZAT</u>	<u>FARM MANAGERS AND SUPERVISORS</u>	<u>FARMERS</u>	<u>AGRICULTURAL ANIMAL HUSBANDRY WORKERS</u>	<u>FORESTRY WORKERS</u>	<u>FISHERMEN, HUNTERS, &amp; RELATED WORKERS</u>	<u>TOTAL</u>
DAMASCUS	154	27,604	27,409	249	27	55,443
ALEPPO	70	72,397	79,411	50	51	151,979
HOMS	22	30,242	25,957	26	237	56,484
HAMA	32	43,561	44,083	49	56	87,781
LATTAKIA	29	28,866	22,445	181	410	51,932
DEIR EZ ZOR	18	25,271	23,728	33	18	49,068
IDLEB	16	31,409	23,620	37	30	55,112
HASAKEH	14	46,997	34,496	12	17	81,536
RAQQA	14	24,459	32,273	3	15	56,764
SWEIDA	1	12,236	5,840	9	0	18,086
DAR'A	5	15,968	9,876	36	2	25,887
TARTOUS	10	27,603	14,609	41	486	42,749
TOTAL	385	386,613	343,748	726	1349	732,821

SOURCE: 1970 POPULATION CENSUS

APPENDIX TABLE 18: CLASSIFICATION OF AGRICULTURE, ANIMAL HUSBANDRY, FORESTRY WORKERS, FISHERMEN AND HUNTERS BY MOHAFAZAT: PERCENTAGE IN EACH CATEGORY, 1970.

<u>MOHAFAZAT</u>	<u>FARM MANAGERS AND SUPERVISORS</u>	<u>FARMERS</u>	<u>AGRICULTURE AND HUSBANDRY WORKERS</u>	<u>FORESTRY WORKERS</u>	<u>FISHERMEN</u>	<u>TOTAL</u>
DAMASCUS	0.3 %	49.8 %	49.4 %	0.4 %	0.04 %	99.9 %
ALEPPO	0.04	47.6	52.3	0.03	0.03	100.0
HOMS	0.04	53.5	46.0	0.04	0.4	100.0
LATTAKIA	0.05	55.6	43.2	0.3	0.8	100.0
DEIR-EZ-ZOR	0.03	51.5	48.3	0.06	0.03	99.9
IDLEB	0.02	57.0	42.9	0.06	0.05	100.0
HASSAKEH	0.02	57.6	42.3	0.01	0.02	100.0
RAKKA	0.02	43.1	56.9	-	0.02	100.0
SWEIDA	-	67.7	32.3	0.05	0	100.0
DAR'A	0.02	61.7	38.2	0.1	-	100.0
TARTOUS	0.02	64.6	34.2	0.1	1.1	100.0
QUNEITRA	-	-	-	-	-	-
TOTAL	0.05 %	52.8	46.9	0.1	0.2	100.0

Source: 1970 Population Census.

APPENDIX TABLE 19: EMPLOYMENT STATUS OF THE AGRICULTURAL WORK FORCE BY MOHAFAZAT, 1970

<u>MOHAFAZAT</u>	<u>UNPAID FAMILY LABOR</u>	<u>PAID IN KIND</u>	<u>PAID IN WAGES</u>	<u>UNPAID APPRENTICE</u>	<u>SELF- EMPLOYED</u>	<u>EMPLOYER</u>	<u>TOTAL</u>
DAMASCUS	11,833	638	14,860	27	26,975	661	54,994
ALEPPO	54,199	1,279	23,701	48	71,200	1,614	152,041
HOMS	16,494	408	8,844	8	29,683	716	56,153
HAMA	28,607	268	15,081	12	42,173	1,570	87,711
LATTAKIA	16,126	388	6,044	14	28,606	365	51,543
DEIR-EZ-ZOR	14,859	1,166	8,094	10	24,896	464	49,489
IDLEB	13,552	652	9,291	11	31,026	592	55,124
HASSAKEH	16,004	1,120	17,515	30	46,192	997	81,858
RAKKA	19,923	1,204	11,158	31	23,924	638	56,878
SWEIDA	3,800	457	1,488	3	12,214	112	18,074
DAR'A	5,582	424	3,700	3	16,046	94	25,859
TARTOUS	10,838	303	3,466	13	27,555	124	42,299
QUNEITRA	460	36	583	0	1,489	3	2,571
TOTAL	212,277	8,343	123,835	210	381,979	7,950	734,594

SOURCE: 1977 POPULATION CENSUS

APPENDIX TABLE 20: EMPLOYMENT STATUS OF THE AGRICULTURAL WORK FORCE BY MOHAFAZAT, PERCENTAGE  
IN EACH CATEGORY, 1970

	<u>UNPAID FAMILY</u> <u>LABOR</u>	<u>PAID IN</u> <u>KIND</u>	<u>PAID IN</u> <u>WAGES</u>	<u>UNPAID</u> <u>APPRENTICE</u>	<u>SELF</u> <u>EMPLOYED</u>	<u>EMPLOYER</u>	<u>TOTAL</u>
DAMASCUS	21.5 %	1.2 %	27.0 %	-	49.1 %	1.2 %	100.0
ALEPPO	35.7	0.8	15.6	-	46.8	1.1	100.0
HOMS	29.4	0.7	15.7	-	52.9	1.3	100.0
HAMA	32.6	0.3	17.2	-	48.1	1.8	100.0
LATTAKIA	31.3	0.8	11.7	-	55.5	0.7	100.0
DEIR EZ ZOR	30.0	2.4	16.4	-	50.3	0.9	100.0
IDLEB	24.6	1.2	16.9	-	56.3	1.1	100.0
HASSAKEH	19.6	1.4	21.4	-	56.4	1.2	100.0
RAKKA	35.0	2.1	19.6	-	42.1	1.1	99.9
SWEIDA	21.0	2.5	8.2	-	67.6	0.6	99.9
DAR'A	21.6	1.6	14.3	-	62.1	0.4	100.0
TARTOUS	25.6	0.7	8.2	-	65.1	0.3	99.9
QUNEITRA	17.9	1.4	22.7	-	57.9	0.1	100.0
TOTAL	28.9 %	1.1 %	16.9 %	-	52.0 %	1.1 %	100.0 %

Source: 1970 Population Census



APPENDIX TABLE 21: LITERACY OF THE AGRICULTURAL WORK FORCE BY TYPE OF WORKER BY MOHAFAZAT, 1970

MOHAFAZAT	FARMERS		FARM MANAGERS AND SUPERVISORS		AGRICULTURAL AND ANIMAL HUSBANDRY WORKERS		TOTAL WORKERS <sup>1</sup> IN AGRICULTURE, ANIMAL HUSBANDRY, FORESTRY, AND FISHING	
	TOTAL	% LITERATE	TOTAL	% LITERATE	TOTAL	% LITERATE	TOTAL	% LITERATE
DAMASCUS	27,604	42.4 %	154	59 %	27,409	52.6 %	55,443	47.4 %
ALEPPO	72,397	27.3	70	74.3	79,411	26.4	151,979	27.0
HOMS	30,242	47.1	22	67.2	25,957	44.7	56,484	46.0
HAMA	43,561	40.6	32	62.5	44,083	35.9	87,781	38.2
LATTAKIA	28,866	45.1	29	58.4	22,446	45.0	51,932	45.1
DEIR EZ ZOR	25,271	18.2	18	66.7	23,728	28.7	49,068	23.7
IDLEB	31,409	30.0	16	87.5	23,620	40.6	55,112	34.5
HASSAKEH	46,997	16.5	14	75.7	34,496	21.9	81,536	18.2
RAKKA	24,459	10.1	14	93.0	32,273	18.0	56,764	17.6
SWEIDA	12,236	51.4	1	100.	5,840	65.2	18,086	55.9
DAR'IA	15,968	36.1	5	100	9,876	55.6	25,887	44.2
TARTOUS	27,603	54.4	10	100	14,609	51.7	42,789	53.3
QUNEITRA <sup>2</sup>	-	-	-	-	-	-	2,574	29.9
TOTAL	386,613	33.5 %	385	68.1 %	343,748	34.8 %	735,395	34.3 %

Source: 1970 Population Census.

<sup>1</sup> THE 2075 FISHERMEN AND FORESTRY WORKERS HAVE BEEN LEFT OUT OF THE ANALYSIS BY MOHAFAZAT. THE NUMBERS UNDER EACH CATEGORY DO NOT TOTAL TO THE FINAL COLUMN. THIS GROUP WAS 45 % LITERATE.

<sup>2</sup> NOT ANALYZED BY GROUPS.

APPENDIX TABLE 22: PERCENT LITERATE OF TOTAL LABOR FORCE BY MOHAFAZA  
AND SEX, 1970 AND 1976

	MALE		FEMALE		TOTAL	
	<u>1970</u>	<u>1976</u>	<u>1970</u>	<u>1976</u>	<u>1970</u>	<u>1976</u>
DAMASCUS CITY	78.0 %	85.6 %	74.8 %	88.3 %	77.9 %	85.9 %
DAMASCUS	61.5	73.5	34.4	70.0	60.4	71.9
ALEPPO	45.6	62.6	17.8	50.0	37.8	61.7
HOMS	66.6	76.3	19.2	45.4	63.6	73.5
HAMA	58.6	71.9	12.6	29.2	50.2	64.5
LATTAKIA	62.4	72.5	19.4	44.7	55.0	68.2
DEIR EZ ZOR	37.1	44.3	11.5	16.6	34.7	43.9
IDLEB	48.0	63.1	13.1	44.9	44.6	61.6
HASSAKEH	30.0	44.8	10.0	26.2	28.4	43.4
RAKKA	32.5	42.5	2.0	25.3	27.1	41.8
SWEIDA	69.0	78.8	35.8	78.7	66.7	79.8
DAR'A	54.1	67.3	15.2	67.4	53.9	67.3
TARTOUS	69.4	76.3	30.2	61.7	68.5	74.9
QUNEITRA	35.8	67.3	29.1	0	35.7	65.4
TOTAL	54.7 %	67.9 %	21.5 %	51.4 %	51.1 %	66.4 %

SOURCE: STATISTICAL ABSTRACT, 1977

APPENDIX TABLE 23: PROPORTION OF SELECTED AGE GROUPS IN THE ACTIVE AGRICULTURAL AND NON-AGRICULTURAL LABOR FORCES, BY SEX 1970\*

<u>AGE</u>	<u>AGRICULTURE</u>		<u>NON AGRICULTURE</u>	
	<u>MALE</u>	<u>FEMALE</u>	<u>MALE</u>	<u>FEMALE</u>
10 - 14	7.1 %	23.2 %	2.9 %	9.4 %
15 - 19	11.4	23.1	10.7	12.4
20 - 39	39.8	32.1	54.6	57.0
40 - 60	27.9	16.1	26.2	17.6
60 +	13.8	5.5	5.6	3.6
TOTAL	100.0 %	100.0 %	100.0 %	100.0 %

SOURCE: 1970 POPULATION CENSUS

\*THOSE SEEKING WORK FOR THE FIRST TIME, MOST OF WHOM WERE UNDER 20 YEARS OF AGE, WERE EXCLUDED FROM THE ABOVE CALCULATIONS AS THEY WERE NOT PART OF EITHER THE FARM OR NON-FARM WORK FORCE.

APPENDIX TABLE 24: FARM LABOR FORCE COMPARED TO NON FARM LABOR FORCE BY AGE GROUPS AND MOHAFAZAT 1970\*

MOHAFAZAT	OVER 64		40 - 64		20 - 39		10 - 19		TOTAL	
	AGR.	NON-AGR.	AGR.	NON-AGR.	AGR.	NON-AGR.	AGR.	NON-AGR.	AGR.	NON-AGR.
DAMASCUS	4,511	1,683	19,533	17,073	21,930	35,496	9,447	10,625	55,421	64,877
ALEPPO	10,155	5,567	43,463	51,220	55,297	87,796	43,045	32,063	151,960	176,646
HOMS	4,497	2,146	18,775	19,541	22,274	35,819	10,989	8,482	56,535	65,988
HAMA	6,047	1,446	24,827	11,701	34,128	23,703	22,748	5,483	87,777	42,333
LATTAKIA	4,325	950	17,552	13,206	21,620	24,809	8,426	3,868	51,923	42,833
DEIR EZ ZOR	3,608	594	13,540	5,806	18,693	11,244	13,212	2,476	49,053	20,120
IDLEB	6,138	1,483	18,241	9,431	20,775	18,321	9,952	4,915	55,106	34,150
HASSAKEH	6,331	924	26,225	8,412	30,111	15,731	18,863	5,351	81,530	30,418
RAKKA	3,150	369	14,170	4,312	20,962	11,801	18,466	2,917	56,748	19,399
SWEIDA	2,108	259	7,536	3,325	6,508	7,796	1,922	1,305	18,074	12,685
DAR'A	3,023	467	8,865	4,468	10,689	10,395	3,305	1,798	25,882	17,068
TARTOUS	3,430	670	15,361	6,863	17,353	14,735	6,593	2,730	42,737	24,998
QUNEITRA	188	29	924	242	995	563	467	89	2,574	923
TOTAL	57,538	16,587	229,012	155,346	281,335	298,204	167,435	82,102	735,320	552,438

SOURCE: 1970 POPULATION CENSUS

\*THOSE SEEKING WORK FOR THE FIRST TIME WERE EXCLUDED FROM THE ANALYSIS



APPENDIX TABLE 25: FARM LABOR FORCE COMPARED TO NON-FARM LABOR FORCE BY AGE GROUP AND MOHAFAZA  
PERCENTAGES IN EACH AGE GROUP, 1970

MOHAFAZAT	OVER 64		40 - 64		20 - 39		10 - 19	
	AG.	NON AGR.	AG.	NON AGR.	AG.	NON AGR.	AG.	NON AGR.
DAMASCUS	8.1	2.6	35.2	26.3	39.6	54.7	17.0	16.4
ALEPPO	6.7	3.2	28.6	29.0	36.4	49.7	28.3	18.2
HOMS	8.0	3.3	33.2	24.6	39.4	54.3	19.4	12.9
HAMA	6.9	3.4	28.3	27.6	38.4	56.0	25.9	13.0
LATTAKIA	8.3	2.2	33.8	30.8	41.6	57.9	16.2	9.0
DEIR EZ ZOR	7.4	3.0	27.6	28.4	38.1	55.9	26.9	12.3
IDLEB	11.1	4.3	33.1	27.6	37.7	53.6	18.1	14.4
HASSAKEH	7.8	3.0	32.2	27.6	36.9	51.7	23.7	17.6
RAKKA	5.6	1.9	25.0	22.2	36.9	60.8	32.5	15.0
SWEIDA	11.7	2.0	41.7	26.2	36.3	61.5	10.6	10.3
DAR'A	11.7	2.7	34.3	25.8	41.3	60.9	12.8	10.5
TARTOUS	8.0	2.7	35.9	27.5	40.6	58.9	15.4	10.9
QUNEITRA	7.3	3.0	35.9	25.3	38.7	58.9	17.8	9.3
TOTAL	7.8	3.0	31.1	28.2	38.3	54.0	22.8	14.9

Source: 1970 Population Census.

APPENDIX TABLE 26: Area Planted to 22 Selected Major Crops  
Considered in Labor Requirement Analysis, 1977

Crop	Hama	Idleb	Rakka	Dier-ez-Zor	Hassakeh	Aleppo
Wheat	125,232	71,417	134,590	76,466	523,792	312,394
Olives	--	66,104	--	--	--	74,151
Cotton	30,880	8,506	29,225	38,455	36,417	35,609
Barley	86,046	47,166	203,808	15,666	328,354	230,000
Grapes	12,462	4,011	--	--	1,000	23,512
Lentils	14,606	29,218	1,912	--	48,054	55,864
Watermelon	15,605	16,823	--	1,507	9,948	31,818
Tomato	--	3,626	--	1,393	--	5,831
Apples	--	2,734	--	550	--	--
Sesame	--	5,609	3,553	9,008	1,343	14,916
Muskmelon	--	6,556	--	1,134	3,552	10,790
Cucumber	2,082	--	--	465	--	5,109
Apricot	--	--	--	1,045	--	--
Chickpeas	--	--	--	--	--	2,873
Potato	2,777	--	--	--	--	--
Vetches	9,274	--	--	--	--	--
Peanut	--	--	--	--	--	--
Dry Onion	2,302	--	--	--	--	1,096
Squash	--	--	--	--	--	--
Sugarbeet	2,956	--	2,928	--	--	--
Eggplant	--	--	--	--	--	--
Tobacco	--	4,637	--	--	--	--
TOTAL INCLUDED	304,222	271,507	376,016	145,689	952,460	803,963
TOTAL CROPS	345,942	310,388	380,322	160,950	959,783	844,926
MISC CROPS	41,720	38,881	4,306	15,261	7,323	40,963
%MISC CROPS	12%	1.3%	1.1%	9.5%	7.6%	4.8%

APPENDIX TABLE 26 (CONT)

CROP	DAMASCUS	HOMS	TARTOUS	LATTAKIA	SWEIDA	DAR'A	QUNEITRA
Wheat	32,461	78,389	34,088	21,067	37,627	74,380	5,785
Olives	3,531	3,523	58,311	18,560	995	1,830	--
Cotton	2,713	4,702	--	--	--	--	--
Barley	20,021	56,358	4,158	4,178	12,765	12,437	535
Grapes	11,948	19,203	1,710	652	12,939	--	755
Lentils	1,752	6,870	--	--	3,766	14,281	--
Watermelon	--	2,095	597	--	6,279	2,658	--
Tomato	2,939	2,552	3,257	5,043	3,039	2,171	288
Apples	7,274	--	1,403	2,674	2,775	--	--
Sesame	--	--	--	--	--	3,465	--
Muskmelon	--	--	--	--	--	--	--
Cucumber	1,538	--	2,925	1,014	2,097	--	--
Apricot	6,284	--	--	--	--	--	--
Chickpeas	3,568	--	2,352	--	5,563	19,425	2,675
Potato	2,884	4,652	799	428	--	439	--
Vetches	4,591	26,428	2,598	--	5,361	13,786	1,760
Peanut	--	--	5,510	4,162	--	--	--
Dry Onion	--	2,178	--	--	--	868	--
Squash	1,220	--	1,032	2,082	--	--	--
Sugarbeet	1,437	3,646	--	--	--	--	--
Eggplant	1,431	--	--	689	--	--	--
Tobacco	--	--	2,057	8,330	--	--	--
TOTAL INCLUDED	105,627	210,596	120,797	68,879	93,206	145,740	11,798
TOTAL CROPS	144,729	250,773	145,326	85,240	95,677	153,998	13,374
MISC CROPS	38,102	40,177	24,529	16,361	2,471	8,258	1,576
%MISC CROPS	27%	16%	17%	19.2%	2.6%	5.4%	11.8%

APPENDIX TABLE 26 (CONT)

CROP	TOTAL CONSIDERED	TOTAL HECTARES	OMITTED HECTARES	PERCENT OMITTED
Wheat	1,527,718	1,527,718	0	0
Olives	227,005	228,263	1258	1.4
Cotton	186,507	186,507	0	0
Barley	1,021,429	1,021,429	0	0
Grapes	93,192	93,973	781	0.8
Lentils	176,323	178,346	2,023	1.1
Watermelon	87,330	87,728	398	0.5
Tomato	30,139	32,791	2,642	5.5
Apples	17,510	19,072	1,562	8.2
Sesame	37,894	39,318	1,424	3.6
Muskmelon	22,032	25,917	3,885	14.9
Cucumber	15,230	18,739	3,509	18.7
Apricot	7,334	11,888	4,554	38.3
Chickpeas	36,456	41,146	4,690	11.4
Potato	11,979	12,830	851	6.6
Vetches	63,793	82,544	18,751	22.7
Peanut	9,672	10,919	1,247	11.4
Dry Onion	6,444	9,433	2,989	31.7
Squash	4,334	7,151	2,917	39.4
Sugarbeet	10,967	12,245	1,278	10.4
Eggplant	2,120	6,180	4,060	65.7
Tobacco	15,024	15,331	307	2.0
TOTAL INCLUDED	3,600,500	3,669,531	58,288	1.67
TOTAL CROPS	3,891,428			
MISC CROPS	280,928			
%MISC CROPS	7.8%			



EXPLANATION FOR APPENDIX TABLE 26:

This table shows the number of hectares grown of the principal crops in each Mohafaza. Blank spaces do not necessarily mean that none of that crop is grown in that Mohafaza, but rather that crop would add more to the computational burden than it would to the precision of the analysis. For example, 1500 ha. of tomatoes are grown in Hama, but adding this crop would be adding only 0.4% of the Mohafaza acreage. In addition, the omitted acreage includes small acreages of other minor crops. At the bottom of this table are shown the acreages omitted from the analysis of labor requirements by Mohafaza with the percentages of those omitted. At the right are the total hectares for each of the 22 crops which were included in the analysis so far. Next are the omitted hectares for each of these crops which, of course, are zero for wheat, barley, and cotton, because all of the acreage grown has been included for these three crops. However, 3,088 ha. of olives, for example, were omitted since their inclusion would have contributed very little to the analysis. At the far right are the omitted hectares as a percentage of total hectares grown of the 22 crops.

APPENDIX TABLE 27: Labor Requirements for Irrigated Wheat, per Hectare.

<u>Farm Operation</u>	(Man-hours)		
	<u>Least</u> <u>Mechanized</u>	<u>Partially</u> <u>Mechanized</u>	<u>Most</u> <u>Mechanized</u>
First tractor tillage	3	3	3
Fertilizing	2	2	1
Second tractor tillage	-	3	3
Animal tillage	50	-	-
Sowing	10	2	1
Harrowing with tractor	-	3	2
Livestock plowing to cover seed	50	-	-
Mech. land forming for irrigate	-	3	3
Manual " " " "	50	-	-
Irrigation	50	50	40
Machine reaping	-	-	10
Manual reaping	80	80	-
Machine threshing	-	45	-
Manual threshing, winnowing, sifting, etc.	76	-	-
Transportation of grain from field	-	-	3
Manual weeding	50	-	-
Herbicide spraying	-	7	7
Guarding	<u>4</u>	<u>4</u>	<u>4</u>
TOTALS	425	202	77

Fully Mechanized Standard:\* 7.5 man-hours per hectare plus irrigation

\*Agricultural Statistics USDA 1977

APPENDIX TABLE 28: Labor Requirements for Non-Irrigated Barley, per Hectare

<u>Farm Operation</u>	<u>Least Mechanized</u>	<u>Partly Mechanized</u>	<u>Most Mechanized</u>
First tractor tillage	3	3	3
Fertilizing	2	2	1
Second tractor tillage	-	3	3
Animal tillage	50	-	-
Sowing	10	2	1
Harrowing with tractor	-	3	2
Livestock plowing to cover seed	50	-	-
Machine reaping	-	-	10
Manual reaping	80	80	-
Machine threshing	-	45	-
Manual threshing, winnowing, sifting, etc.	76	-	-
Transportation of grain from field	-	-	-
Herbicide spraying	-	7	5
Manual weeding	<u>50</u>	<u>-</u>	<u>-</u>
TOTAL	321	145	25

Fully Mechanized Standard: 7.5 man-hours per hectare

APPENDIX TABLE 29: Mechanization of Wheat and Barley Harvest, 1977

<u>Mohafazat</u>	<u>Hectares of Wheat &amp; Barley</u>	<u>Number of Combines</u>	<u>Number of Hectares Per Combine</u>
Damascus	52,512	13	4,039
Dar'a	86,817	34	2,553
Sweida	50,392	21	2,400
Homs	134,747	46	2,929
Hama	177,844	110	1,617
Ghab	33,434	180	186
Lattakia	25,245	6	4,210
Tartous	38,246	28	1,366
Idleb	118,583	150*	790
Aleppo	542,394	370	1,466
Hassakeh	852,146	1069	797
Rakka	338,396	165*	2,050
Dier-ez-Zor	92,132	51	1,807
TOTAL	2,549,210	2,194	1,163 (average)

\* The data for 1977 showed 321 for Idleb, an increase of 127% from the 141 recorded the year before, while for Rakka it showed 110 for a decrease of 35% from the 170 recorded the year before. These changes appear to be too large and seemed out of line with what would be expected, so the data was adjusted to be more in line with the 1976 data.

Source: Statistical Abstract, 1977.



APPENDIX TABLE 30: Labor Requirements for Irrigated Potatoes per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	16
Fertilizing	20
Furrowing	10
Planting	160
Irrigating	70
Hoeing and hilling	200
Harvesting	220
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TOTAL	696

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APPENDIX TABLE 31: Labor Requirements for Irrigated Eggplant per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	9
Animal Tillage	10
Furrowing	40
Fertilizing	10
Seeding	10
Irrigation	120
Hoeing and Weeding	160
Spraying Insecticides	20
Harvesting and Hauling	330
	<hr/>
TOTAL	719

APPENDIX TABLE 32: Labor Requirements for Chickpeas, per Hectare

<u>Farm Operation</u>	<u>Man Hours</u>
Tractor Tillage	8
Planting	4
Spraying Insecticide	2
Harvesting	39
	<hr/>
TOTAL	53

APPENDIX TABLE 33: Labor Requirements for Lentils, per Hectare

<u>Farm Operation</u>	<u>Man Hours</u>
Livestock Plowing	40
Planting	30
Hoeing	20
Harvesting	55
	<hr/>
TOTAL	145

APPENDIX TABLE 34: Labor Requirements for Vetches, per Hectare

<u>Farm Operation</u>	<u>Man Hours</u>
Tractor Tillage	6
Seeding	8
Hoeing	30
Harvesting	120
	<hr/>
TOTAL	164

APPENDIX TABLE 35: Labor Requirements for Irrigated Sugar Beets, per Hectare

<u>Farm Operation</u>	<u>Man Hours</u>
Tractor Tillage	3
Spreading Manure	5
Tractor Disk Tillage	3
Spreading Chemical Fertilizer	2
Livestock Plowing	50
Preparing Land for Irrigation	28
Flooding	12
Planting	9
Irrigation	50
Re-Planting	16
Thinning	40
Hoeing and Weeding	90
Pest Control	16
Digging Beets	100
Cutting Tops, Loading, etc.	120
Guarding	8
TOTAL	562
Fully-Mechanized Standard	75

APPENDIX TABLE 36: Labor Requirements for Muskmelon per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	9
Planting	30
Re-Planting, Thinning & Hilling	25
Fertilizing	20
Hoeing and Weeding	100
Spraying Insecticides	10
Harvesting and Transporting	125
TOTAL	319

APPENDIX TABLE 37: Labor Requirements for Irrigated Cucumbers, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	9
Seeding	30
Re-Planting and Thinning	20
Fertilizing	20
Irrigating	150
Hoeing and Weeding	120
Spraying Insecticides	15
Harvesting and Transporting	150
TOTAL	514

APPENDIX TABLE 38: Labor Requirements for Watermelon, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	9
Planting	30
Re-Planting & Thinning	25
Fertilizing	20
Hoeing and Weeding	100
Spraying Insecticides	10
Harvesting and Transporting	145
TOTAL	339



APPENDIX TABLE 39: Labor Requirements for Non-Irrigated Tobacco, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Seedling Production	170
Plowing X3 with Livestock	90
Transplanting	160
Hoeing Twice	448
Spreading Fertilizer	80
Topping and Chemical Control	420
Harvesting	300
Residue Removal	140
TOTAL	1808
Fully Mechanized Standard	575

APPENDIX TABLE 40: Labor Requirements for Tomatoes, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tillage and Fertilizing	26
Seeding	30
Re-Planting	10
Hoeing and Weeding	150
Spraying Insecticides	20
Harvesting	560
TOTAL	796

APPENDIX TABLE 41: Labor Requirements for Irrigated Dry Onions, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	6
Animal Tillage	30
Spreading Chemical Fertilizer	8
Planting Onion Sets	150
Irrigation	50
Hoeing and Weeding	190
Pest Control	20
Harvesting, Sorting, Cleaning	350
TOTAL	804

APPENDIX TABLE 42: Labor Requirements for Squash, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	10
Spreading Fertilizer	15
Planting	90
Re-Planting	20
Hoeing and Weeding	100
Insecticide Spraying	10
Harvesting	255
TOTAL	500

APPENDIX TABLE 43: Labor Requirements for Apples, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tillage with Animals	130
Hand Tillage	139
Pruning	68
Spreading Manure	36
Spreading Chemical Fertilizer	26
Spraying Trees	115
Harvesting	200
	<hr/>
TOTAL	714

APPENDIX TABLE 44: Labor Requirements for Apricots, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tillage with Animals	69
Hand Tillage	74
Pruning	44
Fertilizing	10
Harvesting	160
	<hr/>
TOTAL	357

APPENDIX TABLE 45: Labor Requirements for Olives, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tillage with Animals	90
Hand Tillage	34
Replacement Planting	2
Pruning	88
Spreading Fertilizer	49
Spraying Trees	65
Harvesting	200
	<hr/>
TOTAL	528

APPENDIX TABLE 46: Labor Requirements for Grapes, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tillage with Animals	86
Hand Tillage	53
Pruning	44
Spreading Manure	34
Pest Control	16
Harvesting	84
	<hr/>
TOTAL	317



APPENDIX TABLE 47: Labor Requirements for Irrigated Cotton, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	12
Gathering Stalks	25
Furrowing	15
Irrigating	90
Planting	20
Thinning	25
Fertilizing	8
Hoeing and Weeding	120
Harvesting, Hauling, etc.	232
TOTAL	<u>547</u>

APPENDIX TABLE 48: Labor Requirements for Sesame, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage	8
Seeding	2
Hoeing	25
Harvesting	65
TOTAL	<u>100</u>

APPENDIX TABLE 49: Labor Requirements for Peanuts, per Hectare

<u>Farm Operations</u>	<u>Man Hours</u>
Tractor Tillage & Fertilizing	20
Planting	100
Irrigation	100
Hoeing	120
Harvesting	220
TOTAL	<u>560</u>

APPENDIX TABLE 50: Labor Requirements for the Major Producing Areas for  
22 Selected Major Crops by Mohafaza in Man-Days, 1976-1977\*

CROP	Deir-ez-Zor	Hama	Idleb	Rakka	Hassakeh	Aleppo	Damascus
Wheat	1,749,276	829,662	490,992	1,054,899	2,798,672	2,069,562	377,708
Olives	--	--	4,366,864	--	--	4,889,967	255,114
Cotton	2,663,009	2,111,420	581,599	1,523,353	2,490,013	2,408,061	185,402
Barley	291,781	548,545	288,893	1,299,276	1,272,873	1,466,250	147,656
Grapes	--	351,083	207,501	--	37,625	931,663	473,440
Lentils	--	264,698	529,577	46,605	901,013	1,012,535	31,755
Watermelon	93,998	866,073	733,904	--	545,898	1,288,287	--
Tomatoes	164,725	--	358,521	--	--	352,048	--
Apples	48,332	--	234,869	--	--	--	666,482
Sesame	191,420	--	70,112	62,177	15,949	188,316	--
Muskmelon	66,484	--	261,422	--	146,076	565,127	--
Cucumber	45,633	98,636	--	--	--	293,089	88,254
Apricot	59,696	--	--	--	--	--	359,260
Chickpeas	--	--	--	--	--	19,034	17,394
Potatoes	--	248,542	--	--	--	--	258,118
Vetches	190,118	--	--	--	--	--	102,721
Peanuts	--	--	--	--	--	--	--
Dry Onions	--	231,353	--	--	--	108,230	--
Squash	--	--	--	--	--	--	75,183
Sugarbeets	--	206,182	--	220,698	--	--	108,315
Eggplant	--	--	--	--	--	--	128,612
Tobacco	--	--	781,245	--	--	--	--
TOTAL	5,374,358	5,946,312	9,005,499	4,212,008	8,208,119	15,592,169	3,592,169

\* For Tables 50 through 55, crop area data refer to 1977, while the employment data come from the 1976 Sample Census.

APPENDIX TABLE 50: Labor Requirements for the Major Producing Areas for  
(cont) 22 Selected Major Crops by Mohafaza in Man-Days, 1976-1977

CROP	Homs	Tartous	Lattakia	Sweida	Dar'a	Quneitra	TOTAL
Wheat	382,146	285,487	262,970	249,275	482,766	38,326	11,076,741
Olives	232,517	3,491,372	984,785	63,670	120,781	--	14,407,070
Cotton	321,507	--	--	--	--	--	12,284,364
Barley	218,388	27,028	46,481	81,378	79,223	3,412	5,771,184
Grapes	355,303	58,754	22,250	545,056	--	25,765	3,108,440
Lentils	124,519	--	--	68,258	258,884	--	3,237,804
Watermelon	88,776	32,014	--	273,922	115,956	--	4,038,828
Tomatoes	282,634	374,963	541,493	168,665	259,435	32,976	2,852,703
Apple	--	115,923	242,232	154,707	--	--	1,462,546
Sesame	--	--	--	--	43,312	--	571,286
Muskmelon	--	--	--	--	--	--	1,039,109
Cucumber	--	167,822	58,180	83,959	--	--	835,576
Apricot	--	--	--	--	--	--	418,956
Chickpeas	--	15,582	--	36,857	128,691	17,722	235,280
Potatoes	402,980	64,719	34,615	--	29,687	--	1,038,661
Vetches	541,744	53,260	--	109,988	282,613	--	1,323,035
Peanuts	--	385,700	291,340	--	--	--	677,040
Dry Onion	219,091	--	--	--	89,234	--	647,908
Squash	--	71,595	144,439	--	--	--	291,217
Sugarbeet	274,819	--	--	--	--	--	810,014
Eggplant	--	--	61,924	--	--	--	190,536
Tobacco	--	454,598	1,884,581	--	--	--	3,120,424
TOTAL	3,444,424	5,598,817	4,575,290	1,837,646	1,890,542	160,881	69,438,722

APPENDIX TABLE 51: Estimation of Labor Requirements for Omitted Acreage, Livestock Production, and Total, in Man-Days, 1976-1977

Item	Hama	Idleb	Rakka	Dier-ez-Zor	Hassakeh
Omitted hectares	41,720	38,881	4,306	15,261	7,323
Omitted hectares $\frac{X250 \text{ man-hr./ha}}{8}$	1,303,750	1,215,031	134,563	476,906	228,844
No. of Milk cows	31,755	13,439	1,107	22,514	23,109
No. Milk cows/ $20 \times \frac{1}{3}$ $\times 365$	193,176	81,754	6,734	136,960	140,580
No. Sheep & Goats	1,352,067	505,604	822,348	663,607	988,000
Sheep & Goats/ $150 \times \frac{1}{2} \times 365$	1,645,004	615,151	1,000,523	807,389	1,202,067
Line 2 + 4 + 6 = Total additional Man - Days	3,141,930	1,911,936	1,141,822	1,421,255	1,571,491
Labor Requirement 22 Major Crops	5,946,312	9,005,499	4,212,008	5,374,358	8,208,119
Total Farm Labor Requirements	9,088,242	10,917,435	5,353,828	6,795,613	9,779,610
Item	Aleppo	Damascus	Homs	Tartous	Lattakia
Omitted hectares	40,963	39,102	40,177	24,529	16,361
Omitted hectares $\frac{X250 \text{ man-hr./ha.}}{8}$	1,280,094	1,221,938	1,255,531	766,531	511,281
No. of Milk cows	9,668	51,735	42,678	35,795	24,162
No. Milk cows/ $20 \times \frac{1}{3}$ $\times 365$	58,814	314,721	259,624	217,753	146,986
No. Sheep & Goats	1,400,267	567,067	1,135,965	64,335	51,161
Sheep & Goats/ $150 \times \frac{1}{2} \times 365$	1,703,658	689,931	1,382,091	78,274	62,083
Line 2 + 4 + 6 = Total additional Man - Days	3,042,566	2,226,590	2,897,246	1,062,558	720,350
Labor Requirement 22 Major Crops	15,592,169	3,542,657	3,444,424	5,598,817	4,575,290
Total Farm Labor Requirements	18,634,735	5,819,247	6,341,670	6,661,375	5,295,640



APPENDIX TABLE 51: Estimation of Labor Requirements for Omitted Acreage,  
Livestock Production, and Total in Man-Days, 1976-1977  
(Cont)

Item	Sweida	Dar'a	Quneitra	Total
Omitted hectares	2,471	8,268	1,576	280,928
Omitted hectares X250 man-hr./ha. 8	77,219	258,375	49,250	8,779,313
No. of Milk cows	8,410	22,745	4,500	291,617
No. Milk cows/20X $\frac{1}{3}$ X365	51,161	138,365	27,375	1,774,003
No. Sheep & Goats	222,833	268,120	39,000	8,080,235
Sheep & Goats/150 X $\frac{1}{2}$ X 365	271,113	326,213	47,450	9,830,947
Line 2 + 4 + 6 = Total additional Man-Days	399,493	722,953	124,075	20,384,268
Labor Requirement 22 Major Crops	1,837,646	1,890,542	160,881	69,438,922
Total Farm Labor Requirements	2,237,139	2,613,495	284,956	89,822,985

APPENDIX TABLE 52: Man-Days Required for Total Acreages of the 22 Selected Major Crops, 1976-1977

<u>Crop</u>	<u>Total Hectares</u>	<u>Total Man-Days Required</u>
Wheat	1,527,718	11,076,714
Barley	1,021,492	5,770,180
Olives	228,263	14,486,909
Cotton	186,507	12,284,364
Grapes	93,973	3,934,490
Lentils	178,346	3,274,774
Watermelon	87,728	4,057,235
Tomatoes	32,791	3,103,719
Apples	19,072	1,593,123
Sesame	39,318	592,620
Muskmelon	25,917	1,222,340
Cucumber	18,739	1,027,544
Apricot	11,888	679,154
Chickpeas	41,146	265,553
Potatoes	12,830	1,112,448
Vetches	82,544	1,711,787
Peanuts	10,919	764,330
Dry Onions	9,433	948,435
Squash	7,151	480,501
Sugar Beets	12,245	904,406
Egg Plant	6,180	555,430
Tobacco	<u>15,331</u>	<u>3,184,186</u>
TOTAL	3,669,531	73,030,223

NOTE: These tables are derived from the crop requirements for each Mohafaza and contain some differences by Mohafaza according to calculated proportions of mechanization, irrigation and yield difference; therefore, they will differ somewhat from the total hectares of each crop times the labor requirements as listed in this appendix.

APPENDIX TABLE 53: Number of Workers Required by Month and by Mohafaza for 22  
Selected Crops Only, 1976-1977

Mohafaza	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Tartous	19100	24039	23969	19682	14217	16545	21802	9544	17221	25754	23889	18936
Homs	5262	9527	12361	12107	27241	16205	17764	11823	16833	14253	8232	5463
Aleppo	31651	42679	53165	39392	52943	88334	69043	45746	43701	61267	59170	37323
Dier-ez-Zor	3190	14389	20538	18017	28397	32845	28677	10070	27789	25467	23901	3450
Hassakeh	8797	10461	17105	20563	40908	60481	35716	13991	50827	42826	28163	8395
Dar'a	4610	5488	7935	3988	16356	12237	7611	4930	5566	4168	3649	2540
Lattakia	8726	18501	13760	12410	18257	19505	21442	17994	14977	20068	17899	8404
Quneitra	165	464	438	208	1949	544	461	427	472	468	336	173
Sweida	3953	4356	5136	5139	11851	11014	7357	8639	9490	8046	5802	4727
Damascus	6882	10415	12651	9565	16091	17337	15406	12154	12532	11649	10185	7762
Idleb	27765	34150	32895	28065	27920	34966	35876	26626	32516	36189	32965	24106
Hama	6311	9469	14967	13112	39690	36874	23766	20501	34321	26097	26357	7838
Rakka	877	5837	9685	11508	24213	40517	28490	8034	29247	27713	18792	2184
TOTAL	127289	189775	224605	193756	320033	382404	313411	190479	295492	303965	259340	131301

APPENDIX TABLE 54:

Total Number of Workers Required by Month and by Mohafaza, 1976-1977

Mohafaza	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total Available Farm Work Force, 1976
Tartous	22977	27916	27846	23559	18094	20422	25679	13421	21098	29631	27766	22813	31195
Homs	13944	18209	21043	20789	35923	24887	26446	20505	25515	22935	16914	14145	42808
Aleppo	40747	51775	62261	48488	62039	97430	78139	54842	52797	70363	68266	46419	97615
Dier-ez-Zor	7267	18466	24615	22094	32474	36922	32754	14147	31866	29544	27978	9527	45643
Hassakeh	13198	14862	21506	24964	45309	64882	40117	18392	55228	47227	37564	12796	63595
Dar'a	6744	7622	10069	6122	18490	14371	9745	7064	7700	6302	5783	4674	16833
Lattakia	12707	22482	17741	16391	22238	23486	25423	21975	18958	24049	21880	12385	44269
Quneitra	467	766	740	510	2251	856	763	738	783	779	647	484	2507
Sweida	5093	5496	6276	6279	12591	12154	8497	9779	10630	9186	6942	5867	10819
Damascus	13707	17240	19476	16390	22916	24162	22231	18971	19357	18474	17010	14587	41600
Idleb	33724	40109	38354	37024	33879	40925	41835	32585	38475	42148	38924	30065	48310
Hama	15672	18830	24328	2247	49051	46235	33127	29862	43682	35458	35718	17199	80163
Rakka	4858	9018	12866	14689	27394	43698	31671	11215	32428	30894	21973	5365	45659
TOTAL	190305	255903	287621	256772	383049	450430	376427	253504	358517	366990	322365	194326	578268



APPENDIX TABLE 55: Average Number of Workers Required; Percentage of Farm Labor Force by Mohafaza, 1976-1977

<u>Mohafaza</u>	<u>Average Monthly Number of Workers Required</u>	<u>Average Monthly Number of Workers Required as % of Farm Labor Force</u>
Tartous	23,434	75.1%
Homs	21,775	50.9%
Aleppo	61,131	62.6%
Deir-ez-Zor	23,805	52.2%
Hassakeh	32,586	51.2%
Dar'a	8,724	51.8%
Lattakia	19,976	45.1%
Quneitra	820	32.7%
Sweida	8,266	76.4%
Damascus	18,711	45.0%
Idleb	37,129	76.9%
Hama	30,970	38.6%
Rakka	<u>20,439</u>	<u>44.8%</u>
TOTAL	307,762	53.2%

APPENDIX TABLE 56: Number and Percentage Unemployed in Urban and Rural Labor Forces by Mohafaza, Sept. 1977.

<u>Mohafaza</u>	<u>Urban Labor Force</u>			<u>Rural Labor Force</u>		
	<u>Employed</u>	<u>Unemployed</u>	<u>Percent</u>	<u>Employed</u>	<u>Unemployed</u>	<u>Percent</u>
Damascus City	278,169	17,596	6.3%	---	---	---
Damascus	54,975	3,091	5.6%	125,441	4,857	3.9%
Aleppo	234,758	13,920	5.9%	151,882	6,605	4.3%
Homs	71,618	4,280	6.0%	78,572	3,838	4.9%
Hama	52,588	3,623	6.9%	103,700	5,815	5.6%
Lattakia	46,804	4,581	9.8%	68,856	3,438	5.0%
Dier-ez-Zor	22,358	2,820	12.6%	52,149	1,838	3.5%
Idleb	25,147	1,788	7.1%	84,616	6,103	7.2%
Rakka	18,773	1,335	7.1%	54,445	1,609	3.0%
Hassakeh	28,738	1,832	6.4%	101,465	10,602	10.4%
Sweida	9,116	1,039	11.4%	22,109	1,898	8.5%
Dar'a	8,958	583	6.5%	46,354	2,747	5.9%
Tartous	<u>17,843</u>	<u>1,997</u>	<u>11.2%</u>	<u>64,695</u>	<u>5,554</u>	<u>8.6%</u>
TOTAL	869,843	58,485	6.7%	957,956	59,949	6.3%

Source: Annual Statistical Bulletin of the Ministry of Social Affairs, 1977.

APPENDIX TABLE 57: Number and Percentage of Farmers  
Unemployed by Mohafaza, 1976

<u>Mohafaza</u>	<u>No. Farmers Unemployed</u>	<u>Unemployed Farmers as % of Farmers</u>
Damascus City	663	9.1%
Damascus	981	2.4%
Homs	899	2.1%
Hama	1924	2.4%
Tartous	1039	3.3%
Lattakia	531	1.2%
Idleb	1612	3.3%
Aleppo	1913	2.0%
Rakka	922	2.0%
Hassakeh	1972	3.1%
Dier-ez-Zor	867	1.9%
Sweida	113	1.1%
Dar'a	372	2.2%
Quneitra	<u>0</u>	<u>0.0%</u>
TOTAL	13,808	2.4%

SOURCE: Annual Statistical Bulletin of the Ministry of Social Affairs and Labor, 1977.

الحافظة	الحد الأدنى العام
دمشق Damascus	8.00
حمص Homs	6.00
حماه Hama	6.00
طرطوس Tartous	6.90
اللاذقية Latakia	6.00
ادلب Idleb	4.00
حلب Aleppo	6.00
الرقية Al-Rakka	6.00
الحسكة Hassaka	6.00
دير الزور Deir-ez-zor	4.00
السويداء Sweida	6.00
درعا Dar'a	6.00
متوسط الحد الأدنى العام Average M.W.	5.91
Mohtafaza	Minimum wage



APPENDIX TABLE 59: Hourly Wage Rates in Various Mohafaza and by Task

<u>Task</u>	<u>1975</u>		<u>1976</u>			<u>1977</u>
	<u>Damascus</u>	<u>Idleb</u>	<u>Idleb</u>	<u>Aleppo</u>	<u>Lattakia</u>	<u>Dar'a</u>
Furrowing	1.38	2.00	1.72	1.74	--	1.34
Seeding	1.75	1.25	1.14	1.42	1.63	1.24
Reseeding	2.00	1.33	1.13	1.04	1.52	1.63
Thinning	--	1.25	1.08	1.21	--	--
Irrigating	1.45	1.25	1.22	1.18	1.69	1.37
Hoeing	2.08	1.-0	1.17	0.91	1.25	1.13
Weeding	1.68	--	1.00	0.92	--	1.23
Harvesting	1.88	0.69	0.93	1.37	1.25	1.46
Residual Cleaning	1.46	--	0.60	--	--	--
Threshing & Winnowing	<u>2.28</u>	<u>--</u>	<u>--</u>	<u>1.09</u>	<u>--</u>	<u>2.01</u>
AVERAGE	1.77	1.25	1.11	1.09	1.47	1.43

SOURCE: Ministry of Agriculture crop budgets. These wage rates reflect averages of wage rates for each of teh groupings from two to as many as 19 for each of the tasks. Wages are in Syrian Pounds per hour.

APPENDIX TABLE 60: Land Area Planted in 1973 Compared to Number of Agricultural Workers in 1970, by Mohafazat<sup>1</sup>

<u>Mohafaza</u>	<u>Planted Area</u> <u>1973</u>	<u>Number of</u> <u>Farm Workers</u>	<u>Planted Area/Worker</u>
Damascus <sup>2</sup>	131,000	69,191	1.9 ha.
Dar'a	137,000	26,694	5.1 ha.
Sweida	99,000	18,182	5.4 ha.
Quneitra	2,000	2,581	0.8 ha.
Homs	273,000	7,286	4.8 ha.
Hama	350,000	87,813	4.0 ha.
Lattakia	85,000	51,968	1.6 ha.
Tartous	127,000	42,914	3.0 ha.
Idleb	286,000	55,120	5.2 ha.
Aleppo	683,000	152,108	4.5 ha.
Hassakeh	664,000	81,802	8.1 ha.
Rakka	437,000	56,769	7.7 ha.
Dier-ez-Zor	<u>123,000</u>	<u>49,095</u>	<u>2.5 ha.</u>
TOTAL	3,397,000	751,519	4.5 ha.

SOURCE: Statistical Abstract, 1974.

1. About 1900 hectares more was planted in 1970 than in 1973, a difference of 0.05% for Syria as a whole. Therefore, the difference by mohafaza is assumed to be small.

2. Damascus City and the rest of the mohafaza were considered together.

APPENDIX TABLE 61: Cultivated Area per Farm Worker by Mohafaza, 1976

<u>Mohafaza</u>	<u>Cultivated Area</u>	<u>Number of Farm Workers</u>	<u>Cultivated Area Per Worker</u>
Damascus	141,076	48,852	2.9 ha.
Dar'a	191,465	16,833	11.4 ha.
Sweida	102,899	10,809	9.5 ha.
Quneitra	17,523	2,507	6.99 ha.
Homs	285,130	42,808	6.67 ha.
Hama	252,316	80,163	4.07 ha.
Ghab*	74,380		
Lattakia	90,582	44,269	2.05 ha.
Tartous	148,826	31,195	4.17 ha.
Idleb	330,014	48,310	6.83 ha.
Aleppo	839,405	97,615	8.60 ha.
Hassakeh	906,590	63,595	14.26 ha.
Rakka	519,231	45,659	11.37 ha.
Dier-ez-Zor	<u>164,520</u>	<u>45,643</u>	<u>3.60 ha.</u>
TOTAL	4,063,957	578,268	7.03 ha.

SOURCE: 1976 Population Census and Annual Agricultural Statistical Abstract 1976.

\* This area was added to Hama and the total divided by the Hama population.

APPENDIX TABLE 62: Value of Production per Hectare by Mohafaza, 1977

<u>Mohafaza</u>	<u>Value of Production per Hectare*</u>
Dar'a	861 S.P.
Aleppo	1298 S.P.
Dier-ez-Zor	1826 S.P.
Rakka	827 S.P.
Hassakeh	593 S.P.
Idleb	1380 S.P.
Tartous	1532 S.P.
Damascus	3491 S.P.
Lattakia	3107 S.P.
Hama	2171 S.P.
Quneitra	1223 S.P.
Homs	1872 S.P.
Sweida	<u>807 S.P.</u>
AVERAGE	1321 S.P.

\* This was estimated from production and prices of 22 principal crops and expanded to total hectares by multiplying the percentage these 22 crops constitute of the entire cropped area.



APPENDIX TABLE 63: Value of Production Compared to Number  
Of Workers by Mohafaza, 1977.

<u>Mohafaza</u>	<u>Crop Value</u> <u>(000S.P.)</u>	<u>Crop Value/Worker</u> <u>(S.P.)</u>	<u>Crop Value Plus</u> <u><math>\frac{1}{2}</math> Livestock Product</u> <u>Value (000 S.P.)</u>	<u>Value per</u> <u>Farm Worker</u>
Dar'a	132,573	7,876	174,182	10,348
Aleppo	1,096,655	11,234	1,251,554	12,821
Dier-ez-Zor	293,337	6,427	322,527	7,066
Rakka	314,513	6,888	349,845	7,662
Hassakeh	569,180	8,950	614,187	9,658
Idleb	428,337	8,866	458,827	9,498
Tartous	222,620	7,136	259,491	8,318
Damascus	505,218	10,342	574,979	11,770
Lattakia	264,860	5,982	287,411	6,492
Hama	751,005	9,368	827,402	10,321
Homs	469,542	10,969	598,341	13,977
Quneitra	16,362	6,526	21,414	8,542
Sweida	<u>77,188</u>	<u>7,134</u>	<u>93,752</u>	<u>8,665</u>
TOTAL	5,141,139	8,891	5,833,285	10,088

APPENDIX TABLE 64: Projected Increases in Rural Labor Force, 1976-81 and 1981

<u>Age</u> <u>Group</u>	<u>Rural 1976</u> <u>Population</u> <sup>a</sup>	<u>Rural 1986</u> <u>Population</u> <sup>a</sup>	<u>Rural 1986</u> <u>Population</u> <sup>a</sup>	<u>% Labor</u> <u>Particip.</u>	<u>1981</u> <u>Available</u> <u>Rural Labor</u>	<u>1986</u> <u>Available</u> <u>Rural Labor</u>
0-4	790,000	-- <sup>b</sup>	-- <sup>b</sup>	0	--	
5-9	692,000	790,000	-- <sup>b</sup>	0	--	
10-14	523,000	692,000	790,000	10.9%	75,428	86,110
15-19	386,000	523,000	692,000	37.2%	194,556	257,424
20-24	278,000	386,000	523,000	34.1%	131,026	178,347
25-29	210,000	278,000	386,000	43.7%	121,486	168,886
30-34	188,000	210,000	278,000			
35-39	184,000	188,000	210,000	54.6%	405,132	469,560
40-44	160,000	184,000	188,000			
45-49	131,000	160,000	184,000			
50-54	101,000	131,000	160,000	73.8%	96,132	118,080
55-59	81,000	101,000	131,000	57.0%	57,570	74,670
60-64	78,000	81,000	101,000	50.0%	40,500	50,500
65-69	65,000	78,000	81,000			
70-74	52,000	65,000	78,000	24.8%	58,280	76,880
75-	80,000	100,000 <sup>c</sup>	120,000 <sup>c</sup>			
TOTAL					1,181,256	1,480,449

a) X10.

b) No projections were made for these age groups as they did not affect the available labor force projections.

c) Assumes the same percentage increase in this age group over the 70-74 age groups as existed in 1976. This thus assumes the death of 32,000 from 1976 to 1981 and 45,000 from 1981 to 1986 in this age group.

APPENDIX TABLE 65: Growth in Rural and Urban Population, 1960-70 and 1970-76

	<u>Rural</u>	<u>Urban</u>	<u>Total</u>
1960 Population	2,880,165	1,689,956	4,565,121
1970 Population	3,563,514	2,741,171	6,304,685
1960-70 Pop. Growth	683,389	1,056,215	1,739,564
% Change 1960-70	23.7%	62.7%	38.1%
Annual Compounded % Change	2.15%	4.99%	3.28%
1976 Pop. Estimate	4,161,355	3,551,830	7,713,185
1970-76 Pop. Growth	597,841	810,659	1,408,500
% Change 1970-76	16.8%	29.7%	22.3%
Annual Compounded % Change	2.62%	4.41%	3.41%

SOURCE: Statistical Abstract, 1977. p.144

APPENDIX TABLE 66: Number and Percentage Unemployment of the Labor Force,  
Urban and Rural, by Educational Status, 1977

	<u>Urban</u>			<u>Rural</u>		
	<u>Employed</u>	<u>Unemployed</u>	<u>% Unemployed</u>	<u>Employed</u>	<u>Unemployed</u>	<u>% Unemployed</u>
<u>Literate:</u>						
Male	578,530	27,136	4.5%	419,105	19,430	4.4%
Female	78,135	5,409	6.4%	22,439	7,779	25.7%
TOTAL	656,665	32,545	4.7%	441,544	27,209	5.8%
<u>Illiterate:</u>						
Male	190,171	12,595	6.2%	375,004	15,729	4.0%
Female	20,077	1,182	5.6%	210,918	11,069	5.0%
TOTAL	210,248	13,777	6.1%	585,922	26,798	4.4%





# Syria: Agricultural Sector Assessment

## Volume 5: Human Resources and Agricultural Institutions Annex

### CHAPTER III

#### RURAL CHANGE

By

A. Eugene Havens

#### TABLE OF CONTENTS

	<u>Page</u>
3.1 Summary: General Tendencies for Change in Villages	2
3.2 Changes in Control over Resources	5
Traditional Land Tenure Patterns	6
Agrarian Reform	7
Inheritance and Fragmentation	9
Service Cooperatives	10
GADEB - Controlled Farms	10
3.3 Technical Changes	17
3.4 Change in a Syrian Village - Mansourah	17
3.5 Jerjer: Rainfed Agriculture	25
3.6 Producer Resistance to Sugar Beet Production: Sugar Versus King Cotton	27
3.7 Cooperatives and the Planning of Agricultural Production	36



The present report deals with technology and the organization of work as a part of the overall human resource assessment in agriculture. The majority of the data presented in this draft are the result of some 14 days spent in rural villages interviewing direct producers and agricultural cooperative leaders. Also, raw data were provided by the Farming Systems Division of ICARDA, and I wish to thank them for their assistance in field work as well as sharing their rich data base with me which provided keen insights into dry land farming in the SAR. The French Insitute for Arabic Studies also provided assistance in understanding Syrian society. Many SAR officials contributed to this report, particularly those of MAAR, State Planning Commission, the Peasant Union, the Cotton Marketing Organization, the GADEB and the Tractor Plant. Also, the patient assistance of my temporary Syrian counterparts made much of this research possible. Obviously, the mistakes are my own but any insights are due to this collegial collaboration.

### 3.1 Summary: General Tendencies of Change in Villages

Perhaps the most fundamental point that should be made at the outset is that village life and production activities are not stagnant. There are some basic and fundamental changes that are unfolding which are significantly affecting village life. I will summarize these changes under four headings: (a) the monetarization of social relations in the village, (b) the new bases for social differentiation, (c) the labor alternatives that present the appearance of labor shortages in agriculture, and (d) the mechanization of production.

#### 3.1.1 Monetarization of Social Relations

Money has become the medium for exchange in most aspects of village life. In previous times, for example, labor exchanges were a prevalent form of accomplishing harvest. Today, most of the harvest is done with hired labor. The household previously was an autonomous unit, but today grows little of its needs, and is dependent on the purchase of food supplies in the village market, the town market and the food card.

What this observation signals is that decision-making strategies for distributing family labor basically attempt to maximize cash income. This doesn't imply that none of the products produced on the farm are consumed on the farm, but that this is now less frequent than it was in the past. The importance of a maximizing cash income strategy for the diffusion of new agricultural technology is that alternative income sources outside of agriculture are very salient. Thus, if a new technology involves a greater management and labor input, farmers evaluate it in terms

of how much cash income the new technology might produce versus male absence from the village working in Saudi Arabia, Turkey, Jordan, Venezuela, Argentina, United States or in construction, livestock projects or olive harvest in the SAR. Increased yields brought about by new technology or crops are attractive only if the presumed price for the commodity would produce a higher family income than working off-the-farm.

An example of how the maximization of cash income predominates decision strategies on how to distribute family labor is the persistence of the damman system in fruits, olives and vegetables. In many instances the product is sold on the trees or vines to the damman who is responsible for harvest and delivery to the souk. This agreement frees family labor to work in non-farm activities, frequently in Saudi Arabia or other neighboring countries. In the Ghouta, the income produced from this work is reinvested in land purchases exploited under rental agreements (See work of the French Institute).

In my village studies, I have found only one area in the Ghab (and not all Ghab areas) where most family labor is held at home producing cotton, sugar beets and vegetables because the villagers are convinced they can make high cash incomes from farm production. This dedication to farming stems from the high soil fertility, available water and a high demand for vegetables. The increase in sugar beet prices this year and the close location to the sugar beet factory also makes this an attractive income producer. In all other villages I have visited, most agricultural labor was performed by women and children with men being absent for long periods working off-farm. (See Jerjer Case Study below.)

### 3.1.2 New Bases for Social Differentiation

These increased family incomes seek new sources of investment. Almost invariably, the increased income is first directed toward improving the home, then towards buying more land and/or the opening of business and in educating sons. Thus, new bases for increasing the gap between high and low income groups within agriculture are present. The sons who can enter the University attain higher paying off-farm jobs and begin to manage farms from a distance, a process which may seriously affect future agricultural productivity. Increased land size, where this is possible, allows a potentially greater income and as long as the alternatives for off-farm work both in the SAR and in many other countries continues, it produces even greater incomes for many farm families. This increased income usually returns to the village in the form of a new home, a car or truck or motorcycle, and, as electrification progresses, in refrigerators, television sets and a new business.



One of the most striking aspects of rural villages is the tremendous amount of construction that is taking place and the high demand for improved services. The improved services demanded center around electrification and potable water. If these services are not provided, we can expect that the higher income families will migrate to urban areas seeking a better standard of living. The next Five Year Plan will need to take these new bases of social differentiation into account and the demand for improved services in the villages if equity and stemming rural-to-urban migration are important considerations. Otherwise, farming may become a less desired economic activity given that relatively high income-producing off-farm work is available. Also, as sons receive more education they may begin to attempt to maintain families in the village, manage the farm from a distance and work in urban occupations.

Planning is complicated by these rapid changes in that by the time the plan is finished most of the assumptions built into the plan may no longer be operative. A complex plan can be constructed to stimulate agricultural production but in many areas male labor may already be distributed outside of agriculture and responses to favorable prices may not occur or be delayed until men return to make the decisions.

### 3.1.3 Appearance of a Labor Shortage

The movement of labor power in and out of the SAR and between sectors of the SAR is essentially a male phenomenon. For many tasks, most agricultural labor is performed by women and children. This explains, in part, why some practices in agriculture persist because the male decision-maker is away. For example, pulling wheat at harvest time on dry land sandy soils is not a reflection of any hard cake of custom or resistance to mechanization, but because it is easier for women to pull wheat than to cut it with a sickle. And since tractor driving is a male job and is male supervised, it is only done when the men are in the village.

There is no absolute labor shortage in terms of low population numbers or a low growth rate. The labor shortage in agriculture is a consequence of the incapacity of planning to keep the available labor power on the farm or even in the country. Higher wage scales may change the flow of labor power out of agriculture but it will also increase cost of production and require either greater subsidies for urban consumers or higher real prices for wage foods. These choices involve difficult political decisions and inflationary tendencies.

#### 3.1.4 Mechanization

When a labor shortage psychology gets built into a plan, it is easy to jump to mechanization as a solution. However, some observations should be made here. Mechanization has proceeded rather rapidly in the SAR (See Tables 7 and 8). Most seedbed preparation (ploughing and disking) is now done by tractor in those areas where land size and terrain permit mechanization. People don't really prefer to hand cultivate; they would prefer to reduce the drudgery of farm work. However, for further mechanization to be profitable it would require a change in irrigation practices and the land holding pattern. Land holdings are extremely fragmented in the SAR and any reconsolidation of them will be highly resisted. This tenure pattern is the single biggest obstacle to further mechanization.

These points represent my overall conclusions concerning change in the Syrian village. They will be demonstrated in the sections which follow and in a series of village case studies.

### 3.2 Changes in Control Over Resources

The two most critical natural resources in agriculture in the SAR are land and water. Since 1946, the struggle over the control of these resources largely defines the recent historical development pattern of Syria. Unfortunately, no systematic work on this struggle, particularly concerning the Syrian peasantry and its role in the State and society, has been performed since Weulersse's classic study in 1946. Seurat's recent work on the peasantry and the State will help to fill this gap when completed (Centre Francais du Etudes Arabe, Damascus). Since the rise to power of the Ba'th Party in 1963, significant changes in control over land and water resources and the role of the Fallaheen in Syrian development have occurred.

Fundamentally, the Ba'th has attempted to break the social and political power of the traditional, largely urban, elite by destroying its monopoly control over land and water markets and the rural labor force. In the process, it has mobilized and organized a peasant base of support and is attempting to integrate State and society by incorporating rural workers into production and distribution through a more equitable and rational distribution of power and resources.

The approach to accomplish these broad goals began with an agrarian reform to effectively eliminate the agrarian bourgeoisie from the power bloc and establish a cooperative form of agricultural production. We will briefly review the historical development of this process.

### 3.2.1 Traditional Land Tenure Patterns

The traditional land tenure patterns in the SAR are a complex set of property relations that mixed classical feudal grants (Zameh holdings) and freeholder rights that emerged as the feudal social organization began to break down. The Zameh holdings followed traditional feudal arrangements wherein a lord was given land grants and peasants performed direct labor on the land. In return for his labor, the peasant received small plots of land for family subsistence, usually located in different ecological niches so that a full range of subsistence needs could be fulfilled. This involved some irrigated lands, some pasture lands and some dryland cropping lands. These plots where peasant workers produced their subsistence needs slowly fragmented over the years as sons and daughters were held on the estate and as pressure on the land grew through population growth and migrant workers sought more permanent ties to the land. By the 1940s, peasants on feudal estates were providing corvée labor to the feudal lord, producing on their usufruct plots and producing on share plots as well as providing servant labor to the lord's family. Share plots usually returned between 15 and 25 percent of the crop to the peasant.

In addition to Zameh holdings, three types of freeholdings existed. The first type of holdings were large private holdings built up by purchases from villagers in times of distress. These purchases usually occurred when loans could not be repaid and when bad crop years prevented family subsistence. The usual pattern was to purchase the lands at a low price and retain the villager on the lands as a sharecropper. Then lands were expropriated and redistributed to the direct producers (Astila lands).

Small private holdings or freeholdings, existed under Mulk or Emiri ownership. Mulk ownership allowed both usufruct rights as well as the right to the soil; i.e., it could be sold. Emiri holdings provided only usufruct with the soil rights being reserved by the state.

Finally, there were Amlak Ame on State domain lands. Prior to the agrarian reform, State domain lands were held in trust for common use by the community. In addition to State domain lands, there are Wakf lands which are held by religious or charitable persons. Wakf lands are not covered by government audit which makes it difficult to judge the extent of holdings or how they are exploited.

Semi-nomadic groups in the steppe also marked out territorial claims that were maintained via kinship and segmentary alliances to form larger cooperative groups that increased territorial claims. For full details of these tenure arrangements and how they have changed, see Manzardo's report.



According to Albos (Land and Agrarian Reform in Syria, Damascus, 1962, p. 38), land holdings in 1952 were distributed as follows:

<u>Size of Holding</u>	<u>Percent of Total Area</u>
Less than 1 hectare	1
1-5 hectares	5
6-10 hectares	7
11-25 ha.	17
26-50 ha.	11
51-100 ha.	10
101-500 ha.	24
501-1000 ha.	9
Over 1000 ha.	16
	<u>100%</u>

About 10 percent of all holders controlled about 50 percent of the land. In addition to the concentration of land ownership, these same large land owners largely controlled access to water and access to the market. Thus, monopoly control over land, water, labor and markets allowed large land owners to appropriate the bulk of agricultural surplus through a combination of ground rents, labor rents and money rents as well as controlling the credit supplies either directly or in alliance with merchants. The peasant movement to break this form of exploitation provided one of the major social forces for the Ba'th Party and its control of the State since 1963. Most of the lands held in the 100 and above hectare category have been expropriated.

### 3.2.2 Agrarian Reform

There is no intention here to provide a complete history of agrarian reform in the SAR since 1958, but only to summarize the reform legislation and to present the outcomes of land distribution. While agrarian reform began in 1958 when Syria was still united with Egypt, significant reform began in 1963. One of the major steps in Decree No. 88 of 1963 was to set ceilings on land ownership. These ceilings were as follows:

#### A. Irrigated Lands:

- 15 ha in the Ghouta
- 20 ha in the Mediterranean coastal area
- 25 ha in Btiha area and its surroundings
- 40 ha in irrigated areas with pumps
- 50 ha in irrigated areas with pumps or any other lifting devices (i.e., the Euphrates, Tigris, Khabur)
- 55 ha in irrigated areas from wells (i.e., Hasakeh, Rakka, and Deir-ez-zor Mohafazat in the northeast part of Syria)
- 45 ha in the remaining areas where irrigation is done via pumps or other lifting devices.



B. Rainfed Lands Planted in Olives and Pistachio for More Than Ten Years:

35 ha in the Lattakia Mohafaza

40 ha in the remaining Mohafazat with olives and pistachio.

C. Rainfed Areas:

80 ha in the areas where the annual average rainfall exceeds 500 mm.

120 ha in the areas where the range of rainfall is 350-500 mm

200 ha in the areas where the rainfall is less than 250 mm

300 ha in the Mohafazat of Al-Hasakeh, Al-Rakka and Deir-ez-zor.

The intent of the law was to make an equitable distribution of the land based on economic value, the nature of crops and agro-climatic conditions. The land reform laws and decrees granted the owner the right to select his parcel of the land which he would retain after the reform; however, the reform agency would select the land to be granted to his immediate family. Furthermore, the law granted corporations and cooperatives the rights of land ownership which could exceed the ceilings of individuals if the lands were to be improved. Also the law granted scientific research organizations the rights of agricultural land ownership which could exceed the maximum allowable to individuals if it would serve the objectives of the reform.

The law explicitly stated that the compensation paid to owners for their expropriated lands was to be ten times the average rent for the previous period. This amount was to be amortized in a forty year period (item 10 of the Land Reform Law of 1961) and an interest paid on the unpaid principal of 1.5%.

The law also stipulated several criteria for selecting the beneficiaries of the land reform. The beneficiary must be an adult of a Syrian Nationality who has had farming as a profession or was a graduate of preparatory agricultural school or was a member of the Bedouin tribes who were enrolled in sedentarization programs. The beneficiaries' total land ownership must not exceed the legal limits. Priorities were given to the following:

- a. Active farmer and tenant
- b. Agricultural worker
- c. Large and poorer family
- d. Village outsiders

Table 1 shows the area of land expropriated under the agrarian reform and how it has been allocated. As can be seen, 1,401,300 hectares were expropriated of which 254,000 ha. have been allocated to cooperatives and Ministries and 466,100 ha. have been distributed to individual holders. Some 329,800 ha. were sold and 351,400 were still not distributed by 1975.

Table 2 shows that by 1977 how much land by Mohafaza is cultivated privately, by cooperatives or under public enterprises. For the SAR as a whole, 76 percent of land is cultivated privately. The largest concentration of private holding occurs in Al-Rakka, Al-Hasakeh, Lattakia, Hama and Aleppo.

Table 3 shows that in 1970, the bulk of land holders (93.64%) have land holdings of 30 ha. or less. Indeed, 50 percent of all holders have access to less than 5 ha. of land.

Table 4 compares the land distribution before the reform (1952) with post reform patterns (1970). Clearly, the reform reduced the preponderance of large holdings (more than 100 ha.) from 49 percent of the land area to around 18 percent. All holdings categories smaller than 50 ha. experienced some increase. The total "less than 5 ha." categories doubled in their importance, which signals the problem of land fragmentation, which occurred during this same period.

Thus, it seems clear that the agrarian reform has effectively produced a large number of land holders with relatively small plots of land.

### 3.2.3 Inheritance and Fragmentation

One of the most severe problems affecting changes in farming techniques and increased productivity is the small size of holdings and land fragmentation. Table 5 indicates that 72 percent of all holders have an average 3.16 ha. of land on four plots. We should keep in mind that these are average figures and it is possible to encounter holders of two ha. of land made up of 10 or more non-contiguous plots. These extremely small plots and basic irrigation techniques effectively prevent the use of most harvest mechanization techniques.

This fragmentation of land comes about principally through inheritance laws. Private lands held on Mulk tenure are inherited by Muslim law which gives each son a full share and each daughter one-half of the share given to sons. Emiri land is inherited under civil law which gives sons and daughters equal shares. In practically no families is the primogenitive inheritance system used. Indeed, Civil Law 59 of 1953 as well as religious sentiment prevents any modification of these inheritance patterns.

Families attempt to consolidate holdings by allowing one or more sons to farm all land and by increasing land holdings through marriages, especially between cousins. Also, rental arrangements still exist that contribute to land consolidation. Nevertheless, land fragmentation under private holding patterns are the greatest single obstacle to further mechanization of Syrian agriculture and to the use of most technologies which require relatively large, coterminous holdings.

### 3.2.4 Service Cooperatives

The SARG has developed programs designed to consolidate land holdings. The policy in this respect is that the cooperative system is a way to attain economies of scale while allowing holders to still identify with plots of land. Table 6 shows the growth of cooperatives from 1960 to 1976. More than half of all land holders are cooperative members. However, producer cooperatives have been slow to develop and most cooperatives are multi-service. Consequently, significant land consolidation has been delayed. The cooperative movement is discussed in greater detail in section 7 of this report.

### 3.2.5 GADEB-Managed Farms

In addition to producer cooperatives, the SARG has also experimented with State managed farms. The most significant area of such farming efforts are occurring in the Euphrates Basin. (For complete details of this project, see Owen's report.) This report will not cover the details about land reclamation and irrigation schemes of the Euphrates project but will focus on how work is organized on the GADEB-managed farms.

The basic organization of work on the GADEB-managed farms turns around a state-appointed manager, state-employed technicians, permanent workers and temporary workers. The manager assigns work tasks without much worker participation in how to distribute tasks. Permanent workers form a syndicate that presents grievances and provides one member to the 12 person production council. Other members of the council consist of the manager, engineers, a representative of the Party and accountants. Thus, major production decisions, labor norms and assignment of work tasks are largely decided with little worker control over these processes. The major power that workers exercise is the threat of strike, which can lead to the expulsion of the manager.

Worker's 1979 daily pay scales vary by age and sex in the following fashion:

<u>Age</u>	<u>Men</u>	<u>Women</u>
12-13	8.00 S.L.	7.00
14-15	10.00	9.50
16-17	11.00	10.00
18+	12.25	11.00

In addition to wages, permanent workers receive one-half dunum of land for private use, a house with two rooms, a kitchen and a bath for 7.00 S.L. per month. The worker also receives free medical treatment and his family receives full medical services at 50 percent of cost. Schools, nurses and social centers are located on the farm and all are free. Finally, families of permanent workers receive first priority for temporary work hiring. Since most



GADEB-managed farms currently employ more temporary workers than permanent workers, it is not uncommon for most families to have three members working most of the year.

If we calculate annual income on the basis of a permanent worker, his wife working as a temporary worker 200 days and his 16 year old daughter working 200 days, permanent worker family cash income would be 3822 S.L. for the male permanent worker, 2200 S.L. for his wife and 2000 S.L. for the 16 year old daughter. Total family cash income would be 8022 S.L. or an average of 668.50 S.L. per month. If we calculate the total cost of all subsidies (housing, medical and schools) plus home-produced goods on the one-half dunum plot at the value of 200 S.L. per month, the real family income per month is 868.50 S.L. If this is a reasonable calculation, annual family income would be 10,422 S.L. or more than a construction worker in Damascus who would average about 7,500 S.L. at 1979 wages. However, the construction worker's family income could be higher if two other family members were working. The family expenses would also be higher. The GADEB farm offers a fairly competitive family income.

Why, then, have the GADEB-managed farms had difficulty attracting permanent workers? The answer seems to lie in the perception that once you become a worker on a GADEB-managed farm, you are confined to that job for life. In reality, there are procedures for terminating work contracts. However, workers fear that the acceptance of such employment will reduce their mobility.

Mobility does tend to be reduced in two ways. First, leaving the job does require a bureaucratic procedure. Secondly, the tendency to reassign workers to the same task day after day does reduce worker training and upward mobility within the farm structure. However, courses are given for tractor drivers and equipment repair that is a form of labor mobility.

In my interviews with both workers and managers, the work process seems to be controlled in the following fashion:

- a. The manager decides who does each task.
- b. Each task is accompanied by a labor norm. For example, each worker should irrigate four dunums in an eight hour day. This seems to be low since on private farms a worker is expected to irrigate 10 dunums in a day. However, it was reported that this irrigation norm was seldom attained.
- c. Bonuses are given for exceeding the norm and fines are assessed for not attaining the norms. After the bonus system was established, the norms were exceeded. For example, for each additional dunum irrigated per day, a worker receives a 3 S.L. bonus.



TABLE 1: AREA OF LAND EXPROPRIATED ACCORDING TO AGRARIAN REFORM  
ALLOCATION AND DISTRIBUTION BY MOHAFAZAT UP TO 1975 (1000 ha.)

Mohafaza	Total Expropriated Lands				Excluded and Sold Lands				Distributed Lands			
	Total	Uncultivated	Non-irrigated	Irrigated & Planted to Trees	Non-Distributed Lands	Allocated Lands	Total	Non-irrigated	Irrigated & Planted to Trees	Total	Non-irrigated	Irrigated & Planted to Trees
Damascus	62.0	-	55.7	6.3	0.5	3.0	37.9	37.9	-	20.6	14.3	6.3
Aleppo	301.5	63.2	231.8	6.5	25.8	22.7	105.6	105.1	0.5	147.4	141.6	5.8
Homs	151.7	57.0	88.3	6.4	0.5	38.5	51.0	50.3	0.7	61.7	56.6	5.1
Hama	114.7	22.5	89.5	2.7	3.2	2.9	25.7	25.3	0.4	82.9	80.6	2.3
Lattakia	6.3	1.0	2.3	3.0	-	0.5	1.0	0.9	0.1	4.8	1.9	2.9
Deir-ez-zor	17.7	-	7.9	9.8	5.2	2.7	0.4	-	0.4	9.4	-	9.4
Idleb	83.7	18.6	61.2	3.9	9.9	17.8	2.2	2.2	-	53.8	49.9	3.9
Al-Hasakeh	466.6	3.2	454.0	9.4	306.1	139.6	6.1	4.3	1.8	14.8	7.3	7.5
Al-Rakka	166.4	18.4	131.2	16.8	0.2	25.7	91.1	88.9	2.2	49.4	34.9	14.5
Al-Sweida	3.1	-	3.1	-	-	0.0	0.7	0.7	-	2.4	2.4	-
Dar'a	8.6	-	8.3	0.3	-	0.1	3.6	3.6	-	4.9	4.6	0.3
Tartous	10.7	1.6	6.6	2.5	-	0.5	2.6	2.4	0.2	7.6	5.3	2.3
Quneitra	8.3	-	7.9	0.4	-	0.0	1.9	1.9	-	6.4	6.0	0.4
Total	1401.3	185.5	1147.8	68.0	351.4	254.0	329.8	323.5	6.3	466.1	405.4	60.7

Source: CBS, Statistical Abstract, 1978.

TABLE 2: AREA CULTIVATED LANDS BY SECTOR (PUBLIC - COOPERATIVE - PRIVATE)  
AND BY MOHAFAZAT 1977 (1000 ha.)

Mohafaza	Cultivated Area			Cultivable Area				
	Total	Private	Cooper- ative	Public	Total	Private	Cooper- ative	Public
Damascus	125.0	82.1	42.2	0.7	206.0	112.3	93.0	0.7
Aleppo	841.0	660.9	179.6	0.5	1234.0	913.5	320.0	0.5
Homs	252.0	134.7	117.3	-	404.0	263.0	141.0	-
Hama	370.0	263.2	106.6	0.2	507.0	350.8	156.0	0.2
Lattakia	89.0	62.6	26.0	0.4	106.0	72.6	33.0	0.4
Deir-ez-zor	129.0	85.8	42.6	0.6	140.0	84.4	55.0	0.6
Idleb	308.0	227.1	80.9	-	341.0	209.0	132.0	-
Al-Hasakeh	907.0	767.6	104.4	35.0	1460.0	1278.0	147.0	35.0
Al-Rakka	468.0	435.4	25.9	6.7	711.0	649.3	55.0	6.7
Al-Sweida	83.0	45.8	37.2	-	199.0	133.0	66.0	-
Dar'a	152.0	112.3	39.2	0.5	271.0	205.5	65.0	0.5
Tartous	130.0	58.2	71.8	-	130.0	52.0	78.0	-
Quneitra	13.0	5.1	7.9	-	155.0	142.0	13.0	-
Total	3867.0	2940.8	881.6	44.6	5864.0	4465.4	1354.0	44.6

Source: CBS, Statistical Abstracts, 1978,

TABLE 3: DISTRIBUTION OF LAND HOLDERS AND HOLDINGS IN SIZE BY DUNUMS-1970

Area Classes in Dunum	No. of Holders	%	Cumulative % Holding Number	Area in Dunams	% of Area	Cumulative % Area
1 & less than 4	23716	5.98	5.98	50216	0.14	0.14
4 " " " 5	8383	2.11	8.09	33532	0.09	0.23
5 " " "10	37668	9.49	17.58	252171	0.68	0.91
10 " " "15	33221	8.37	25.95	377441	1.02	1.93
15 " " "20	24892	6.27	32.22	403266	1.09	3.02
20 " " "40	81785	20.61	52.83	2187983	5.90	8.92
40 " " "60	43369	10.93	63.76	2019441	5.44	14.36
60 " " "80	27329	6.89	70.65	1816048	4.90	19.26
80 " " "100	17695	4.53	75.18	1544825	4.17	23.43
100 " " "150	32801	8.26	83.44	3818775	10.30	33.73
150 " " "200	18954	4.78	88.22	3130453	2.44	42.17
200 " " "300	21528	5.42	93.64	4988669	13.45	55.62
300 " " "500	15221	3.84	97.48	5519921	14.88	70.50
500 " " "1000	6762	1.70	99.18	4313025	11.63	82.13
1000 " " "2000	2182	0.55	99.73	2783398	7.50	89.63
2000 " " "3000	521	0.13	99.86	1171276	3.15	92.78
3000 and more	566	0.14	100.00	2679629	7.22	100.00
TOTAL	396863	100.0		37090069	100.00	

Source: 1970 Agricultural Census.

TABLE 4: DISTRIBUTION OF LAND IN SYRIA BEFORE AND AFTER THE AGRARIAN REFORM

	% Of Area	
	1952	1970
Less than 2 ha.	1%	3%
2-5 ha.	5%	9%
6-10 ha.	7%	12%
11-25 ha.	17%	25%
26-50 ha.	11%	22%
51-100 ha.	10%	11%
101-500 ha.	24%	18%
501-1000 ha.	9%	
over 1000 ha.	16%	
TOTAL	100%	100%

Source: A.H. Abbas, "Land and Agrarian Reform in Syria", Mimeo, Damascus, 1967, p. 38

TABLE 5: DISTRIBUTION AND LAND FRAGMENTATION (FOR HOLDERS WITH AGRICULTURE AS THEIR MAIN OCCUPATION)

Area ha	Holdings		Gross Total Area		Parcels		Fragmentation Index*	Average Size per Parcel**
	No.	%	ha	%	No.	%		
Small under 10	294839	71.89	935504.5	21.39	1179035	65.12	4.0	.79
Medium 10-100	111170	27.11	2524284.8	57.72	610785	33.73	5.5	4.13
Large over 100	4121	1.00	913455.7	20.89	20869	1.15	5.06	44.33
TOTAL	410130	100.0	4373244.7	100.0	1810689	100.0		

Source: Recalculated from 1970 Agricultural Census

\*Fragmentation Index = No. of Parcels / No. of Holdings.

\*\*Average Size per Parcel = Gross Area / No. of Parcels.

TABLE 6: GROWTH IN COOPS AND MEMBERS BY YEAR AND MOHAFAZAT

Mohafaza	1960		1970		1976	
	Coops	Members	Coops	Members	Coops	Members
Damascus	22	2440	114	8193	236	25539
Dar'a	-	-	27	1203	130	7552
Al-Sweida	19	694	30	1053	123	10255
Quneitra	9	107	9	274	42	4843
Homs	31	3084	200	11004	359	19300
Hama	42	1975	235	22393	318	34855
Aleppo	32	-	382	19509	701	27606
Idleb	77	4271	170	11445	380	27117
Lattakia	24	1942	118	4504	360	13155
Tartous	10	432	106	8177	283	25772
Al-Rakka	1	315	85	5016	143	10235
Dier-ez-zor	5	1229	54	7770	89	32386
Al-Hasakeh	5	399	68	3151	321	17420
TOTALS	277	17925	1598	103689	3385	256036

Source: Bakkour: Supporting Policies and Services for Agrarian Reform Programme in Syria. Damascus, April 1978, Table 3.



It appears clear that workers on the GADEB-managed farms do not define their participation as workers who also manage the collective enterprise but, rather, in a traditional worker-management relationship. Managers complain that workers lack incentives and spend more time protecting their labor time than meeting production goals. Managers also fear workers' capacity to expel them from their jobs. Moreover, managers argue that workers are not technically skilled, lack interest in the farm enterprise and are too politicized. In brief, managers do not see the workers as a docile, easily controlled work force.

On the other hand, workers see managers as a boss and not as a fellow worker. Frequently, the manager is an agricultural engineer from Damascus who indeed is unfamiliar with the crops grown in the Euphrates Basin and is in the unenviable position of being held responsible by the GADEB administration for not meeting production goals.

These are not unusual problems for GADEB farms to encounter in their first years of life. These problems, therefore, should not be used as arguments against collectivization. Indeed, the potential for increased productivity and equitable distribution of surplus produced on them often exceeds the problems being encountered. Some recommendations are presented as long run strategies to overcome worker/management conflicts on the GADEB-managed farms.

1. Work tasks should be rotated and training courses provided so that all workers learn the full range of farm management and production problems.
2. GADEB farm workers should receive short courses on how to organize the work process and how to manage their resources.
3. Work councils should be established that allow worker participation initially in assigning work and gradually extended to the full range of production decisions.
4. The longer term goal should be a fully worker controlled production council instead of the current ratio of 11 technicians to one worker. This worker-controlled production council should eventually hire and fire managers.
5. As shown above, worker compensation on the GADEB farms is competitive with other sectors of agriculture and construction. The best way to dispel rumors about the work conditions on these farms is to build a satisfied work force that truly participates in the management of production and the distribution of surpluses. Workers should be fully informed about annual earnings, the share of earnings returned

to workers and should be allowed to recommend how surplus is distributed. This does not imply sacrificing macro-planning, but workers should be informed about these planning goals and asked to contribute to establishing them.

### 3.3 Technological Changes in Syrian Agriculture

The rate of technological change in Syrian agriculture has been rapid throughout the 1970s. Tables 7, 8 and 9 show the increase in the use of agricultural machinery and fertilizers from 1970 to 1977. For example, from 1970 to 1977 the number of tractors used has quadrupled (Table 7). Table 8 shows that over 3,000 new tractors are sold each year. Table 9 shows that fertilizer use has increased by more than 100,000 tons since 1970.

The SARG has established a number of state agencies to produce and diffuse new technology to agricultural producers. These include (1) the Seed Improvement Program, (2) Experimental Farms, (3) Extension Services, (4) the Peasant Union, (5) the Tractor Plant, and (6) the licensing program for agricultural production.

The licensing program, in effect, shifts some of the decision making on new technology away from the individual producer to the national planning process. Nevertheless, private producers still make the critical decision concerning whether or not to license their production. The case studies that follow will detail how technological change occurs in agriculture and some of the problems encountered in this process.

### 3.4 Change in a Syrian Village: Mansourah 1975-1979

Mansourah village is located about 20 km from Rakka on the new road to Aleppo. The Mansourah village was originally studied by Dr. Yahia Bakkour in 1975. In 1975, there were 161 families residing in Mansourah comprising 972 individuals. In 1979, there were 169 families comprising 1065 individuals. The change in the number of families is a partial expression of the changes that have affected Mansourah village during the last four years. Mansourah has changed from a rather typical rural village that was a commercial center for more distant villages wherein almost all income was generated from the sale of crops and livestock. It now is a thriving center for commercial activity, repair shops for tractors and cars, the administrative center for the regional Fodder District and in general is experiencing economic growth coming from multiple sources of income. In 1975, Mansourah had no electricity, potable water, schools or a health center. Today it has electricity and potable water, a full-time health center with a doctor and two nurses and two new schools: one primary and one middle school. Most sons of school age attend these schools and a few daughter are also attending--but very few.

Table 7: Agricultural Machines Used in Cultivation 1971-1977

Years	No. of Sprayers		Insecticides		No. of Fixed Threshers		Combined Harvester Threshers		Harvesters		Pulverizers		Plough		Water Raining Pumps		Tractors	
	By Hand	Motor	By Hand	Motor	By Hand	Motor	By Tractor	By Motor	By Animal	By Tractor	By Disk	By Harrow & Seeder	Old	Modern			50 horse & more	Less than 50 Horse
1971	2099	1010	14967	7455	531	65	1368	-	52	1117	1929	83087	13210	29437	3283	6323		
1972	1787	899	12095	6788	657	86	1294	2	49	1105	1660	107235	13620	29954	4705	5669		
1973	2761	831	11815	7587	814	122	1587	23	77	1557	1656	116878	15117	32192	5857	5717		
1974	2832	836	12737	17316	1102	87	1657	1	92	1782	1702	126710	17430	37591	6813	6051		
1975	3031	1325	12614	8706	1367	57	1607	-	60	2012	1903	113743	20253	40416	9030	6273		
1976	2866	1337	13632	9406	1448	58	2088	5	59	2486	2020	113483	23714	40500	12140	6463		
1977	3222	1153	11735		1512	105	2254	23	48	2687	2087	108301	26310	40650	14227	6445		

-18-

Source: CBS, Statistical Abstract, 1978

TABLE 8: NUMBER OF TRACTORS SOLD FOR AGRICULTURAL USE, 1971-1977

Years	Total	Over 30 H.P.	16-30 H.P.	Under 16 H.P.
1971	819	804	1	14
1972	283	283	-	-
1973	1330	1305	25	-
1974	1786	1783	3	-
1975	3881	3727	154	-
1976	3876	3765	111	-
1977	3042	3000	42	-

Source: CBS, Statistical Abstract, 1978.

TABLE 9: CHEMICAL FERTILIZERS USED IN AGRICULTURE 1971-1977

Years	Total	Compound Fertilizer	Potassium Fertilizer	Phosphatic Fertilizer	Nitrogen Fertilizer
1971	157025	26655	93	32657	97320
1972	162345	23130	697	25837	112681
1973	170585	23049	261	20614	126661
1974	144917	6284	799	19873	117961
1975	164642	6788	1825	35861	120168
1976	211084	10711	2082	39711	158580
1977	259360	5483	3299	65368	185210

Source: CBS, Statistical Abstract, 1978.



The in-migration of 15 new families to the village since 1975 was partially offset by seven families leaving the village. These family migration patterns are directly attributable to the Euphrates Dam and land reclamation projects. Seven of the new families previously resided on the flood plain and have now settled in Mansourah. They have obtained land by renting from the state or by receiving agrarian reform lands. The other in-migrant families are involved in a variety of economic activities: one family has a shop for tractor repair, another is a merchant, some herd livestock and some work as agricultural day laborers. The seven families that left Mansourah have moved to the state-managed farms in the region.

The major change in Mansourah agriculture is represented by the mechanization of seedbed preparation and cultivation and the digging of 80 wells in the lower steppes. Each well has three pumps and will irrigate between five and seven hectares. Thus some 500 additional ha. of irrigated agriculture activity has changed family income. Orchard crops and poplar trees are being planted in these areas along with some cotton once a windbreak is established.

Mechanization of agriculture is occurring. The ten tractors in the village are in heavy demand for plowing and cultivating and seeding cotton with the takbeaa system for seeding which involves planting of seeds through tubes mounted behind the plow. If tractors are not available for this operation, it is not uncommon to broadcast cotton seed. It is estimated that about 30 percent of cotton in Mansourah is planted by broadcasting; however, it is not the preferred method. One tractor is owned by the multipurpose cooperative in the village. Six tractors are owned by cooperative members and three tractors are owned by non-farmers who deal in custom work. There are two 50 horsepower tractors, two 82 horsepower tractors and six 70 horsepower tractors. The reported custom rate for plowing is five Syrian Pounds per dunum or 50 S.L. per ha. This rate is lower than in the Aleppo area where plowing can range from 60 - 90 S.L. per ha. There are no differences reported in tractor rental between the cooperative charge for tractor rental and the private fee. While the seedbed preparation, planting and some cultivation are mechanized, all cotton and sugar beets are harvested by hand. The basic limitation on mechanizing the harvest of crops are the small plot sizes and basin irrigation.

There are two private landowners who rent out 300 dunums of land to 25 different renters or about 12 dunums per renter. The basic central agreement is that the landowner provides irrigation, machinery, 60 percent of the seed and 60 percent of the fertilizer and takes 60 percent of the total product. The sharerenter provides all labor, 40 percent of seed and fertilizer. The landowner can obtain loans from the agricultural bank at the rate of 40 S.L. per dunum. He gives 16 S.L. per dunum to the sharerenter for the purchase of seed and fertilizer. The sharerenter must repay this to the landowner at harvest.

The major increase in farm size reflects the increase of cultivable land due to well irrigation. The 80 wells that have been dug have been financed from a variety of sources, but none by the agricultural bank. The basic sources of financing for the digging of wells and the purchase of pumps were savings, selling of goats and informal financing from friends and relatives. Also, some people financed the cost of their own wells by developing digging rigs and digging wells for others. There is some land concentration occurring along with well irrigation since most of the wells were dug by two families pooling their resources and then sharing the water. However, three farmers have two wells each which allows them to almost triple their cultivated land size. They also engage in informal labor sharing to provide labor for the new lands that are, in effect, a form of share renting but it is not so-called because this would require them to stop being cooperative members.

Table 10 summarizes the series of changes that have occurred since 1975. As indicated in the table, annual average income is now above 13,000 S.L. The holders interviewed agreed unanimously on how the additional income was allocated. The following list reflects their priorities for how to distribute their income:

1. Educate their sons
2. Building new houses or adding additional rooms
3. Buying a car or tractor
4. Increasing production with new inputs
5. Start a well-digging business or shop.

As we can see from this set of priorities, a considerable portion of the increased income in the village is directed toward improving the quality of life of the villagers. Increased consumption in the form of purchase of more foodstuffs, radios and television sets, educating sons and improving the home are the top priorities for expenditures. Consequently, increasing agricultural productivity ranks fourth on their list of priorities. But this must be considered within the framework of the SAR cooperative movement and provisioning of inputs through the agricultural bank in terms of the production licenses. It also must be considered in terms of the previous investment these producers have made in well irrigation. They have already increased their agricultural activity and now desire a better life style for the village. And they are creating that different life style. One should keep in mind that village life in this part of Syria is not isolated but villagers are well travelled. Indeed, 10 village male adults are currently working in Saudi Arabia and most males travel frequently to Iraq, Turkey, Aleppo and Damascus.

A key question is how long will villagers be able to reproduce their current levels of income. About 5000 S.L. per year of family income comes from off-farm work in other countries or in related

TABLE 10: CHANGE IN MANSOURAH VILLAGE, 1975-1979

Item	1975	1979
1. Schools	0	2
2. Number of Families	161	169
3. Total Population	972	1065
4. Percent Male	43.1	40.2
5. Major Crops	Cotton, Barley Wheat	Cotton, Sugar Beets, Wheat
6. Number of Wells	0	80
7. Average Annual Income	8525 S.L.	13,000 S.L.
8. Number of Well Pumps	0	240
9. Number of river pumps	No Information	Has Increased
10. % house made from mud and brick	96.7	49.0
11. Average size of land holding	5.2 ha.	7.0 ha.
12. Number of families leaving village since 1975	N/A	7
13. Number of new families in village since 1975	N/A	15
14. Principal source of income	livestock, crops	Livestock, crops wages
15. Number of Tractors	0	10



activities with the Euphrates project. Also, some income is derived from well digging and construction work. The construction boom has logical limits, and as they are reached alternative sources of family income will be more difficult to encounter. As life styles change, any decline in income can easily be translated into unrest which may have potential political implications.

The villagers' two basic complaints center around reclamation of their lands along the Euphrates and the growing of sugar beets. Since the resistance to sugar beet production is the subject of another section of this report, I will briefly mention it here simply to complete the changes in Mansourah village. Sugar beet production was incorporated into the fourth Five Year Plan and licencing began in 1978 in the Mansourah area. However, no extension service to explain sugar beet production was available. Basically, producers are not familiar with the cropping practices for sugar beets and - do not like to grow them. Given their lack of knowledge about sugar beet production, their yields are very low--less than 15 tons per hectare. With these low yields, cotton is a much better income producer. Also cotton can be picked by women and children whereas sugar beets are pulled by men. It is hard work and as long as alternative sources of employment are available for men, they will not work on sugar beet harvests. Thus, there appears to be a labor shortage but in reality it is a shortage produced by the nature of the work conditions and not a lack of available labor. The local cooperative members feel that since they are being forced to grow sugar beets, they should be subsidized for the losses they are taking by not growing cotton. They also feel that cotton provides more roughage and firewood as additional inputs to their livestock enterprises and household supplies.

Of course, sugar beet tops are a lot better roughage but only for a short period of time since they dry out quickly after they are cut. The cotton leaves stay fresher longer after harvest and can be grazed. More detail on sugar beet production and resistance to it are covered later in this report.

The other major concern of farmers is for their lands along the Euphrates. The Mansourah village lies within the 27,000 ha. of river bank land that should be reclaimed as a part of the Euphrates land reclamation project. Historically, the lands bordering on the river have been subdivided into many small plots with uneven land demarcation boundaries and hand leveling technology for basin irrigation. These private plots and their attendant technology makes it almost impossible to apply mechanization to agriculture. The land reclamation project involves leveling and the installation of cement canals to rationalize production all along the river bank. The land holding pattern in these areas is a complex mixture of state lands, private holdings and reformed units.



To accomplish full mechanization of production, land leveling and the placement of canals to replace pump irrigation should be arranged in such a fashion that crop rotations and mechanization can be applied on large land areas. GADEB has reclaimed only 3,400 ha. out of a total of 27,000 ha. A problem has been holder resistance to the collectivization of small plots. Each farmer wants his own parcel and to decide what to produce on it according to his own survival strategy. Rumors abound in the area that GADEB wants to take over all these lands and convert them to state farms.

Mansourah producers do not agree with the land reclamation project since they fear the loss of control over their holdings and production decisions that may not fit into their own survival schemes and income maximizing matrix. They are aware that GADEB will pay them for crop losses and income losses while the land is being leveled and canals are constructed. But they fear that the lands will not be given back.

In fact, final policy decision regarding reclaimed lands along the banks of the Euphrates has not been defined. But the broad policy guidelines seem to have been laid out. These turn around the following points: (1) respect the private holdings, (2) state land will not be redistributed, and (3) private holders must join cooperatives for servicing production. After the land has been reclaimed, the private holders will receive an equivalent amount of improved land in terms of value but they must develop a crop rotation that will permit all production to occur in a contiguous area. That is, all wheat would be in one area, all cotton in another and all sugar beets in still another. This sort of redistribution would permit collective mechanization of production.

The basic policy on the lands joining the Euphrates is to build confidence among holders via reimbursements during reclamation and the return of the land to each producer. It is hoped that experience with the service cooperatives will build into a collectivized production cooperative. However, the holders in Mansourah village have been totally opposed to land reclamation because they fear the loss of their land. So far the opposition has been so great that GADEB has not even begun baseline surveys.

This sort of village unity couched in terms of the protection of private property has significantly slowed GADEB reclamation projects along the Euphrates' banks. Indeed, the policy implications are so great that they have been passed all the way up to the national party directorate and so far no decision has been reached. In the meantime, land reclamation of these 27,000 ha. has been significantly slowed.

Another consideration has been financial. It is estimated by the President of the Confederation of Peasant Unions in Rakka that 60 million S.L. have been spent on reclaiming the 3,400 ha. completed. This becomes a 17,645 S.L. investment for each hectare, which is extremely difficult to recover in the immediate future. These financial considerations are probably the basic obstacle to defining a high level policy decision as to the reclaimed lands and their ownership. The political consideration of alienating a significant proportion of the peasant union will probably reduce any short term collectivization of agricultural production in this part of the Euphrates project. This, in part, accounts for the shifting of emphasis to state lands even though the costs of this decision (which involves pumping stations that will eventually absorb 80 percent of the total electrical energy produced by the Euphrates Dam) is extremely high.

### 3.5 Jerjer: Rainfed Agriculture

Jerjer (a pseudonym) is located in the Aleppo Mohafaza. The village consists of 85 farming households. Only one farming household is a traditional private holding: all other are beneficiaries of the agrarian reform. The principal economic activities in agriculture are livestock, barley and wheat. Most income is derived from livestock and off-farm work. The cooperative in the village is controlled by one of the larger land and livestock owners who also works on the committee to distribute cement. His son is the official tractor driver for the cooperative and the tractor is frequently used for family activities of the cooperative president. The size of land holdings in the village vary from two hectares to 45 ha. on several plots with each plot comprising about five dunums. Average family size is eight. Average monthly cash household expenditures on food and clothing are about 682 S.L. and about 200 S.L. per month on medical expenses. There are about 10,000 head of livestock in the village.

The main crops grown are wheat, barley, lentils and watermelon. In a very dry year, such as this year, barley is frequently pastured prior to heading. This year, for example, the barley that was threshed barely returned enough grain to recover what was seeded plus the straw for roughage. Seedbed preparation is performed by tractor either with the cooperative tractor or the rental of private tractors. There are eight privately owned tractors in the village. If fertilizer is used, it is almost always bought on the free market since in Zone Three and Four lands (low rainfall) nobody officially gets subsidized fertilizer from the agricultural bank since these lands are not licenced for crops. Fertilizer can be purchased (unsubsidized) from the agricultural bank, but the free market price is the same or only slightly higher. Free

market fertilizer bags are marked as having been produced in Romania, Turkey, Libya, Cyprus and Iraq. The Romanian and Iraqi fertilizer usually comes from farmers who have received fertilizer as part of their liscence and have sold it for a cash in-flow. The rest comes through the souk.

Harvesting is done with the sickle, since plots are very fragmented. Threshing is performed by the Jerjer. Every family has a jerjer and the threshing is done by women and children. The wheat, after being cut in the fields, is transported to the village by tractor at the cost of 15 S.L. per load.

The major economic activity in the village is livestock. From May to October, the livestock are around the village grazing crop residues. During September and October, cotton and sugar beet land is rented for grazing. From November to January most roughage is provided by stored wheat, barley and lentil straw or by purchase. From February to May the livestock are sent to badia range areas.

While the livestock are around the village and if the men are in the village, almost constant sale and purchase of livestock takes place. This is done as a means of improving herds and of shipping sheep out of Syria. This exportation is accomplished through a complicated scheme for getting Turkish sheep with tags not yet placed in their ears. The tags are then placed in the ears of local sheep which are sent to Turkey where they bring a higher price. All of this activity requires a rather sophisticated level of knowledge of the souk structure and good contacts with the right merchants. Any livestock grower that does not have these contacts will be hard pressed to make high profits even though the state-controlled slaughter program attempts to assure a reasonable rate of profit. The problem is that the assured rate of return is lower than the rate of profit that can be realized working through the souk. This dual market is one reason why the State slaughtering houses are working at about twenty percent of installed capacity.

This year many goats have replaced sheep in this area. Goat prices are one Syrian Pound higher per live kilo than sheep prices. The goats are largely shipped to Jordan.

Since wheat and barley are harvested in late May, most men leave the village for outside work during the summer, at least. The alternative sources of employment available in the Jerjer village are stone cutting which pays 1,000 S.L. per month, house construction in the area which pays about 800 S.L. per month, working in the State bureaucratic sector, or migrating for a few months to Saudi Arabia. They will return in September to pick up their families and pick olives until planting time for wheat and barley. Thus, for about five months of the year, the village is almost void of adult males!



This case study demonstrates how family labor is distributed so as to maximize cash income. It also demonstrates the structural impediments to further mechanization of crop production; i.e., land fragmentation and land holding patterns. Finally, it suggests that labor has several high paying alternatives to work on the farm.

### 3.6 Resistance to the Cultivation of Sugar Beets: Sugar Versus King Cotton

The general circumstances relating to the fourth Five Year Plan's target of 60,000 ha. of sugar beet production with an average yield of 30 tons per ha. by 1980 need to be briefly stated. Syria imported in 1976 roughly 140,000 tons of raw sugar at a cost of about 1.27 S.L. per kilogram. Raw sugar is processed in the Syrian mills, thus allowing them to operate about 300 days a year instead of the targeted 100 day during sugar beet harvest. While this provides employment year round for sugar mill workers, the importation of such a large quantity of raw sugar represents a strain on the SAR's balance of payments situation and also makes Syria highly dependent on the vicissitudes of the world market.

The SARG attempts to limit per capita consumption of sugar by providing 1.5 kilos of sugar a month per person on a subsidized system of food cards. The food card price for a kilo of sugar is 85 piasters while the free market price for a kilo of sugar is 1.90 S.L. as of May 1979. All families take advantage of their quotas on the subsidized food card system, but they also buy about 30 percent of their total family consumption on the free market. (This figure is based on interviews conducted during the first part of June in rural areas. I have no data on urban areas, but given the nature of income distribution and total imports plus national sugar beet production, this is probably a close estimate for a national average.) Apparently, the ration supplied quantity of sugar is not very successful in reducing per capita sugar consumption. Thus, Syria's need for greater sugar production or greater imports is self-evident.

This report will not treat the macro-economics of national sugar beet production versus importing raw sugar except to point out that Syria's ration price for processed sugar at 85 piasters is considerably lower than the retail price in neighboring countries which establishes favorable conditions for illegal traffic in sugar. This may have the effect of SARG subsidizing consumers in Beirut, Baghdad and Amman since illegal trade routes in sugar are well-established. Subsidized sugar is bought on the food card and sold to middle men who deal in contraband sugar. It is also possible that the balance of payments circumstances could be more easily improved by increasing cotton exports of raw fiber to known markets



and import sugar. Nevertheless, the decision has been taken to produce sugar beets nationally and four new sugar processing plants at a cost of about US\$50 million per plant are being installed and two of them are almost ready for operation. (Presumably, the plant in Meskeneh is operative but last year's tests were disappointing, so it really is not in a fully operative state.)

The question I will attempt to address is why the 1980 target of 60,000 ha. of sugar beet production with an average yield of 30 tons per ha. will not be reached. The reasons for the lack of attainment of the total production may be summarized as follows: (1) delays in the land reclamation projects in the middle Euphrates Basin that have only reclaimed 4,300 ha. of a programmed 27,000 ha. that were brought about by technical problems and producer resistance to collectivization, (2) labor recruitment and labor productivity problems on the state farms, (3) structural limitations to the further mechanization of sugar beet production, and (4) the almost total lack of sufficient knowledge about sugar beet production on the varying soil and water conditions in Syria and no effective extension of the available knowledge that does exist. Each of these problems will be briefly detailed.

### 3.6.1 Middle Euphrates Basin and Resistance to Collectivization of Sugar Beet Production

The land reclamation project of the middle Euphrates Basin encompassed 27,211 ha. of land along the river bank that have been farmed by river pump irrigation. The reclamation project calls for land levelling and the installation of surface irrigation canals. Some 3,735 ha. will be occupied by infrastructure when the project is completed, leaving a net of 23,476 reclaimed hectares. However, 45 villages existed in the area comprising 7,700 families for a total population of 51,145 inhabitants. Of these 7,700 families, 6,476 worked in agriculture with 2,678 families owning land that totalled 13,946 ha. The majority of these families (2,445) cultivated the land by themselves with no hired labor or rental agreements. Thus, the agrarian reform affected only 4,378 ha. of the total area which have been reclaimed plus an additional 2,708 ha. of state land. In brief, the middle Euphrates Basin area was a small holder area with 69.45 percent of the families possessing less than five ha. of land. The critical concern of these land holders was, and is, to retain their land in separate plots and to exploit them as they see fit. Holder resistance to the land reclamation project has been strong due to the fear of losing their lands.

Faced with this resistance, the reclamation project has been delayed awaiting a high level political decision concerning how to organize production on the reclaimed land. Moreover, technical problems have arisen. The soils in the basin are high in salinity and gypsum. Thus, high quantities of water must move through the lands to flush them of these minerals.

All of these factors have slowed reclamation in the basin area and given a higher priority to the middle Euphrates non-basin area for land reclamation. Given that the non-basin lands are higher than the lake area, a pumping station had to be constructed to lift lake water 90 meters to irrigate the non-basin lands. The pumping station is in operation and levelling and canal construction is underway.

In order to quiet rumors of forced collectivization and the take-over of private lands, the policy of GADEB has been to move slowly and return reclaimed lands to the holders. This has helped to build rapport but it has not hastened development of the project nor has it rationalized production on what are now extremely costly projects.

Current hopes are that the non-basin areas in the middle Euphrates will fulfill production quotas of sugar beets on new lands. If this is to happen, clear policy guidelines must be laid down that will assure the production of sugar beets on large tracts of land that can be fully mechanized. If not, holder resistance will continue and, in the absence of assurances that sugar beets are a profitable crop, avoidance mechanisms will quickly develop to prevent the attainment of production quotas.

#### 3.6.2 Labor Recruitment and Labor Productivity on State Farms

The state farms in the GADEB area are divided into three regions that comprise 21,000 ha. which, in turn, are designed as 15 pilot farms and five research stations. So far, about 50 percent of the lands are in production of sugar beets (both autumn and summer beets), cotton, wheat, poplars, fruit trees and maize.

Due to the newness of the crops, the novelty of the idea of State managed farms, and the lack of experience with both cropping practices and labor relations, it has been difficult to recruit full-time workers. For example, the Rabiha pilot project has only 100 permanent workers and 225 women and 120 men day laborers for 1200 cultivated hectares. The seasonal workers perform the harder tasks so as to encourage the recruitment of permanent workers and build confidence in the collectivization of agricultural production. Experiments with bonuses and subsidies are underway to encourage worker recruitment but in the process both production norms and labor performance norms have been set too low. For example, the production norm for sugar beets for this year has been set at 20 tons per hectare--a full ten tons below the hoped for national average and probably twenty tons lower than a profitable production norm if investments are to be recoverable and a surplus produced.

The State farm located by the Meskenah sugar plant of 4,000 ha. has, as of June 1979, only 30 out of a projected 1,400 permanent workers. Production norms are low and labor productivity is only

average with serious labor shortages for the requirements of the 1,000 ha. of sugar beets that were planted in 1979. However, this area could be more fully mechanized if the knowledge was available to do so, thus reducing the labor requirements. (For further details, see Owen's report and section 3.5 of this report.)

### 3.6.3 Structural Limitations to Mechanization of Sugar Beet Production

The greatest single limitation to further mechanization of sugar beet production on state farms and larger private farms is the lack of an adequate seeder that will allow the planting of monogerm seed at a sufficient rate that will assure the optimal number of plants per hectare. The current seeders do not work well in heavy soils and plug constantly, thus reducing the plant count. Consequently, on both State farms I visited, polygerm seeds were being hand planted and then thinned. This increases the labor requirement tremendously. There is also a shortage of available pre-emergent weed killer and lack of knowledge about how to use it with heavy surface irrigation. It has been applied before irrigation and planting, thus being washed away before weed seeds start to germinate. One alternative is to irrigate and let the weeds germinate. Then an additional cultivation could kill the early weeds, break up the gypsum crust and planting should take place while the subsoil is wet and pre-emergent weed killers applied. Irrigation would follow after the beet crop has come up so that any subsequent gypsum layer would not prevent the beet from breaking through the crust. The exact procedure needs to be urgently established on the research farms. Also, the beet monogerm seed should be obtained and propagated through the Seed Improvement Program. This could significantly improve production on large fields.

The greatest deterrent to mechanization of sugar beet production on non-state farms (i.e., cooperatives) are small plot size and basin irrigation. As long as these two production forms are maintained, sugar beets will have to be thinned, weeded and harvested by hand. Producers do not resist mechanization, per se, but do resist giving up control of their own plots. This means the fragmentation and the scattering into extremely small plots of the sugar beet acreage. As long as these structural forms persist, mechanization of harvesting is effectively prevented.

### 3.6.4 Lack of Sufficient Knowledge about Sugar Beet Production

One of the most serious bottlenecks to increasing sugar beet production is the lack of sufficient information concerning the management of production of sugar beets specific to the climatic and soil conditions that vary so tremendously in Syria. Sugar beets are currently being grown on clay soils, silty loam soils, heavy gumbo soils, and sandy soils in areas of varying rainfall, wind and temperature. The successful crop management techniques specific to the multiple combination of these conditions are not developed



in Syria. For example, there is little information made available to the producer about the best plowing depth, timing and amount of irrigation, best planting time to assure maximum sugar content at the specified time of delivery to the factory (this delivery time is specified by contract and if not delivered at that time, the price is reduced) or optimal amounts of fertilizer to assure maximum yield. Indeed, the establishment of a single fertilizer rate for all fields in a given area is extremely counter-productive. Such a rate does not take into account the variability of soil and water conditions between plots.

An additional knowledge gap exists regarding the amount of labor required for sugar beet production. Any producer will tell you that sugar beets require much more labor than cotton. Yet Tables 11 and 12 demonstrate that the labor requirements are almost identical. This information should be widely diffused in the SAR.

Farmers, in the absence of specific information about sugar beet production, frequently transfer proven cultivation techniques from cotton to sugar beets. Unfortunately, these developed cotton production techniques are not appropriate for sugar beets (e.g., deep plowing and planting of cotton whereas sugar beets need shallow plowing right before planting). As a result of these inappropriate cultivation techniques, yields and sugar content are low and thus profits per hectare are low. This experience, coupled with technical problems at the Meskenah plant last year that caused the beets delivered there to have to be transferred to Hama which reduced the sugar content at processing, have convinced sugar beet growers on small plots in the middle Euphrates and in some parts of the Ghab that sugar beet growing is not as profitable as cotton.

Table 13 shows that cost of production and returns to sugar beets on two cooperatives and a private farm. It should be noted that only hired labor was included as the labor component in these cost figures. However, the net return can be attributed to either capital or family labor once one knows the organization of production for each unit.

The Jaed village in the Ghab is a multi-purpose cooperative in an area of cotton, wheat, sunflower, corn, onion, peanuts and live-stock production. The cooperative has 293 members who own a total of 657 hectares. The average income of the village is about 7,000 S.L. per family. Hardly any family members leave the village for other work. That is, family labor is essentially distributed to agricultural labor within the village while sons attend school and strive to enter the university. Consequently, most village labor is performed by women and female children. Bedouin labor and school children supplement village labor at peak harvest labor demands. The cooperative follows precisely the fertilizer rates, pesticide



TABLE 11: LABOR REQUIREMENTS FOR IRRIGATED SUGAR BEETS, PER HECTARE

Farm Operation	Man-Hours
Tractor Tillage	3
Spreading Manure	5
Tractor Disk Tillage	3
Spreading Chemical Fertilizer	2
Livestock Plowing	50
Preparing Land for Irrigation	28
Flooding	12
Planting	9
Irrigation	50
Re-Planting	16
Thinning	40
Hoeing and Weeding	90
Pest Control	16
Digging Beets	100
Cutting Tops, Loading, etc.	120
Guarding	8
TOTAL	562

Source: Schmid's report, Appendix Table 35.

TABLE 12: LABOR REQUIREMENTS FOR IRRIGATED COTTON, PER HECTARE

Farm Operation	Man-Hours
Tractor Tillage	12
Gathering Stalks	25
Furrowing	15
Irrigating	90
Planting	20
Thinning	25
Fertilizing	8
Hoeing and Weeding	120
Harvesting, Hauling, etc.	232
TOTAL	547

Source: Schmid's report, Appendix Table 47.

rate, seed rates for the seeds furnished by the contract for sugar beets. A parallel fertilizer market exists, if the producers desire to increase fertilizer amounts. However, the agricultural bank price is 42 S.L. / 50 kilos of 18-46 nitrogen phosphate while the parallel market rate is 50 or 60 S.L. / 50 kilos. Consequently the cooperative members only use the amounts provided by the contract.

As Table 13 indicates, the net return per hectare of sugar beets in this cooperative are 1,400 S.L. Most of these returns should be attributed to the cooperative labor input since no additional capital resources are added nor is careful management attention given to sugar beet production. Management attention is devoted to vegetables, cotton and livestock. The members suggest that cotton and vegetables are much more profitable and thus resist the growing of sugar beets. According to my calculations, cotton is returning 2,250 S.L. and vegetables are returning about 2,800 S.L. per hectare. (Note that the vegetable prices are not controlled at village and town markets. As new sugar factories require a proletarianized labor force, an active food market exists in the area and producers like to sell to this market.)

The private farm area is near Aleppo in the Zirbeh Mantika. The private grower has 80 ha. of sugar beets with sprinkler irrigation. Sprinkler irrigation is the best irrigation system for fully mechanized sugar beet production. It also requires about one-half the total water requirement of basin irrigation. Moreover, one worker can sprinkler irrigate 10 ha. per day while basin irrigation requires one worker per hectare. The private producers are importing seed from the United States and have imported three fully mechanized beet harvesters. They are conducting their own experiments concerning depth of plowing, irrigation rates and planting rates. They are using monogerm seed and have developed a drill that will not plug with the clay soil on which they are growing sugar beets.

The private growers are producing beets with all hired labor. No family labor is directed to sugar beet production. They are investing significant amounts of capital in sprinkler irrigation and machinery. They clearly are responding to the SAR's pricing policy between cotton and sugar beets as part of the plan to divert 40,000 ha. of cotton to sugar beet production. Also, in this area the price per ton of sugar beets delivered to the factory is higher than the Ghab area (190 S.L. / ton versus 175 S.L. / ton in the Ghab) in order to encourage sugar beet production in the upper and middle Euphrates. They indicated that they will grow sugar beets over cotton as long as current price differentials and cotton varieties are maintained. For example, Aleppo 1 cotton variety is beginning to become susceptible to disease and does not produce as long and sturdy a fiber as the best world market prices demand. (Aleppo 40 that will be grown

on all farms by 1980 seems to have resolved this problem. Depending on the price policy and the performance of Aleppo 40, these private sugar beet growers may well switch back to cotton since their basic interest is profit and not SARG development goals.)

The returns per hectare in this area are averaging 2,350 S.L. this year. However, they anticipate increasing yields as they learn more about the crop and anticipate eventually attaining 70 tons per hectare. Since the large investment costs have been made, future returns could be significantly higher than cotton. For example, if they attain a 70 ton yield and input costs remain the same, return per hectare would be 7,100 S.L. Obviously, this is a return to capital for this type of farm. The source of this capital investment is accumulated wealth and commercial dealing and not credit from the Agricultural Bank.

The last area presented in Table 13 is Sif Safeh located in the middle Euphrates Basin area that has not yet been reclaimed. The area is river pump irrigated lands and non-irrigated lands in the badia. It is a multi-service cooperative that comprises 215 members and about 1,720 persons. The total population of the village is 2,918 which includes private farmers that are not cooperative members, tractor repair shops, village commerce and Bedouins. This year the cooperative has 573 dunums of sugar beets on 412 different plots, most of which are not contiguous.

As Table 13 indicates, sugar beets are not given any attention in this cooperative. They have planted the sugar beets because the plan called for them but have invested no cooperative or hired labor on thinning and weeding. The plots are choked with weeds and the stand is very uneven, broad spaces with no plants followed by spaces with way too many plants. Major income in the cooperative comes from vegetables, cotton and the 12,000 head of sheep and goats. As can be seen from Table 13, no return will be realized from sugar beets this year.

When asked why the lack of attention to the sugar beets, the following reasons were given:

1. they do not know how to grow beets and nobody has given them information
2. lack of interest because of low return
3. competing demands for labor and sugar beets have a high labor requirement
4. there is a new insect affecting beets and nobody knows how to control it
5. high price for goats this year (8 S.L. per live kilo versus 7 S.L. per live kilo for sheep) that are sold in Jordan and Saudi Arabia.



Clearly, in a village where the cooperative members have 12,000 head of goats and sheep, major attention will be given to livestock. Herein lies a problem involved in trying to obligate producers in mixed livestock and crop enterprises to grow sugar beets. Cotton not only produces seed cotton but it also produces leaves for livestock grazing and stalks for fuel for ovens. Of course, the sugar beet tops are good roughage but once they are cut they dry up very fast. Cotton on the other hand maintains its leaves after picking the bolls and can provide roughage over a much longer time. The producers in Sif Safeh insist that cotton is a much better roughage than sugar beet tops. Sugar beets would require a change in maintaining sheep and goats in the village and either roughage would have to be purchased or the sheep would have to go to the badia or to some other area. Going to the badia earlier would also require the purchase of roughage since pasturing can only be done at certain times.

This complex interrelationship between production decisions and alternatives between livestock and crops has been overlooked in the plans up to now. The decision to grow sugar beets brings into play the entire set of social relationships that are on-going in village life such as how to distribute family labor, the movement of people and livestock, the alternative labor markets that may produce a higher family income and the strong family attachment to the land and village life. It also involves the close interrelationship between different systems of production. Switching to sugar beets not only involves the direct producer but the movement of livestock between farmers and grazers, thus affecting income for a wide range of settled villagers and semi-nomadic groups.

There is no on-going training program in the universities that combines technical skills with social relationships. Thus, the technical knowledge that is attempted to be diffused is scoffed by these producers because they know how it affects the social relations. A training program that combines both technical skills, research skills and field practicum wherein students work in cooperatives and participate in the production process and thus learn about village structure and process is sorely needed. Such a program would not only produce better extension agents but would also produce better researchers and planners.

#### 3.6.5 Summary of Resistances to Sugar Beet Production

1. Lack of detailed technical knowledge about sugar beet production on varying soil and water conditions.

2. Structural impediments to mechanization that turn around land tenure arrangements and basin irrigation. Land holdings are extremely fragmented in the agrarian reform lands. It is not uncommon for a producer to have about 20 ha. of land on 12 or more distinct plots (i.e., not contiguous). This scattering of plots has developed historically as a way of assuring year round production and, therefore, income. One or two plots of irrigated land, three plots in fallow, two plots of badia pasture, three plots of dry land crops is a very common occurrence. Such a land holding pattern mitigates against



mechanization. Basin irrigation involves planting sugar beets on the slopes of each furrow. Thus, lifting beets with a slicer is impossible with current equipment. As long as sugar beets are grown under these land tenure and water conditions, sugar beets will require hand planting and harvesting. If the target goal of 60,000 hectares of sugar beets was obtained, a potentially severe labor shortage could occur. Most agricultural hand labor is performed by women and children. Pulling sugar beets out of clay is an extremely difficult task. Men have many more profitable labor alternatives either in agriculture or in construction or outside of the SAR.

3. The cost of attaining the goal of 60,000 hectares of sugar beets with an average yield of 30 tons per hectare are extremely high. For example, the sugar beet factories would only operate 100 days a year since now raw sugar imports would be needed which currently allows 300 days a year operation. This 200 day idle capacity time is costly and the problem of maintaining a skilled labor force for plant operations are paramount. There are also political costs since I am convinced that mechanized sugar beet production on 60,000 hectares will require land reconsolidation, reclamation and collectivization (or else large private holders with hired labor). The wisdom of this plan should be seriously re-evaluated. It would probably be best to cut back on total hectares to somewhere around 30,000 and confine sugar beet production to fully mechanized State farms, collective producer cooperatives and larger, more consolidated holdings. The additional sugar requirement could be made up by importing raw sugar and thus allow the plants to operate about 225 days per year. However, this option would involve stopping the installation of the last two sugar plants. (Note that the parameters of sugar production and its consequences for other sectors could be specified by Penson's model.)

4. Introducing sugar beets on mixed crop and livestock units will continue to be resisted since sugar beet production does not fit into the ongoing system of production on these units. Producers on those units take decisions not in terms of returns per hectare but in terms of returns to the entire enterprise. Alternative uses of family labor will provide greater return on these units than sugar beets can provide even though they are profitable on a per hectare basis.

### 3.7 Cooperatives and the Planning of Agricultural Production

The general and strategic aims of the fourth Five Year Plan place a heavy emphasis on the agricultural sector. These aims turn around a balanced agricultural-industrial economy, the development and protection of agricultural resources and to exploit these resources fully, to achieve self-sufficiency in foodstuffs and garments, to provide full employment, to raise levels of living and to accomplish all of this in a equitable fashion. The main economic form for the plan for agricultural production is the cooperative.

TABLE 13: COSTS OF PRODUCTION AND RETURN ON SUGAR BEETS IN THREE DISTINCT TYPES OF ENTERPRISES WITHOUT INCLUDING FAMILY OR COOP LABOR

Cost per Hectare and Task	Jaed Village Coop in the Ghab	Private Farmer Zirbeh, Aleppo	Sif Safeh Euphrates River Basin GADEB
1. Plowing	200	200	200
2. Planting	50	50	50
3. Thinning-Weeding	1000	500 <sup>c</sup>	0 <sup>h</sup>
4. Seeds	70	270 <sup>d</sup>	70
5. Fertilizer	380	950 <sup>e</sup>	380
6. Insecticides/Pre-emergent weed	60	200	60
7. Irrigation	50 <sup>a</sup>	2100 <sup>f</sup>	800
8. Harvest	650	1200	2000 <sup>i</sup>
9. Transportation	<u>390</u>	<u>830</u>	<u>200</u>
10. Total Cost	3850 S.L.	6200 S.L.	3760 S.L.
11. Gross Profit	5250 <sup>b</sup> S.L.	8550 <sup>g</sup> S.L.	3800 <sup>j</sup> S.L.
12. Return	1400 S.L.	2350 S.L.	40 S.L.

a. Jaed village suffers from a high water table, only spot irrigation

b. 30 tons/ha. at 170 S.L./ton at Jisr Alshugour

c. Private farmer uses monogerm seed and pre-emergent weed killer thus no thinning cost and little weeding

d. Uses imported seed at 45 S.L./kilo

e. Uses greater amount of fertilizer bought on free market

f. Sprinkler irrigation. This cost includes amortisation of original investment for sprinklers which is estimated at 3,000 S.L. /ha.

g. 45 tons/ha. at 190 S.L./ton at Meskeneh

h. No labor was hired for thinning or weeding. Personal observation of plots revealed poor stands in places and crowding in other spots and extremely weedy.

i. Due to many alternatives for labor in the Euphrates area, they had to pay 20 S.L. /day to obtain workers for sugar beet harvest.

Specifically, the plan states, "to ensure gradual and voluntary replacement of the individual formula by the cooperative formula in the sectors of agriculture, professions, housing, domestic trade and transport at higher than previous rates." While the number of cooperatives and cooperative members have increased under the plan, cooperative forms of production have not been forthcoming. Since cooperative forms of production may be seen as an agricultural innovation, this final section of my report will look at the resistance to the adoption of the cooperative form of production.

Over the past several years, the notion has been popularized that cooperative farming is the most rational, efficient, and equitable manner to reorganize agriculture in societies experiencing agrarian reforms. The demise of the traditional landlord systems under the pressure of peasant movements has proceeded apace in a number of societies and has raised the basic policy question, what system of land tenure should take its place?

The SARG has answered this question in terms of planning and cooperative farming while respecting individual claims to the land. The basic problem with this approach is that it attempts to manage dilemmas which may be unmanageable. To have a plan carried-out requires social control and control often requires limitations on the decisions of private producers about what to produce and how to produce on their own parcels of land. The hoped-for solution to this contradiction has been to convince cooperative members of the viability of cooperative production via the provisioning through multipurpose service cooperatives of key agricultural inputs. The Party would add to this action the dimension of an educational program for producers that would establish collective production as a dominant ideology and the careful and subtle use of State power to attain compliance. Progress, however, has been slow given that only six production cooperatives have been established up to the present.

Since 1974, the cooperative organization and the Peasant Union have been merged under Legislation No. 21. Table 14 shows the growth of the Peasant Union and membership in 1977. This merger was intended to further the cooperative movement under the following structures:

1. Formation of multipurpose service cooperatives at the village level (in some cases the cooperative cuts across more than one village but usually not).
2. Common associations at the District level.



3. Specialized Cooperative Associations. For example, today there are 58 Livestock Breeding Cooperatives and a limited number of Machinery Cooperatives. However, about 90 per-cent of all cooperatives are multi-purpose service cooperatives.

One of the hope-for goals of the fusion of the cooperatives with the Peasant Union was to further the idea of production cooperatives. As stated above, this has resulted in only six production cooperatives in the entire country. We will suggest at the end of this section some of the reasons for why this complex change in the organization of production has not come about and some possible alternatives to increase producer willingness to change their form of production from individual plots to the collectivization of the production process.

#### 3.7.1 The Peasant Union as a Form of Control

One of the basic functions of the Peasant Union is to assure producer agreement and compliance with the production licencing system. This form of control is exercised in the following fashion:

1. A general plan specifying hectares of production for each licenced crop and an average rate of fertilizer to be used, seeding rate, pesticide use and production output yield target is sent from the Mohafaza Peasant Union organization to each village cooperative.
2. Usually the proposed plan arrives in June and agreement is reached on the plan by September. However, there are instances wherein dissident members of the cooperatives refuse to agree and the approval of the plan is delayed. In one of the villages I visited, the plan for 1979 was not agreed upon until December which created problems for many producers since the inputs arrived late and not all of the fertilizer was still available at the Agricultural Cooperative Bank.
3. Upon agreeing with the plan, a licence is issued to the cooperative. Based on the licence, the cooperative can receive fertilizer, seeds, pesticides and some cash from the Agricultural Cooperative Bank. The amount of cash varies by the crop included in the plan, but in most cases the cash loan is about 400 S.L. per hectare licenced. This amount of cash has to last the entire production cycle (sometimes it is paid at two different times) or be supplemented by family savings, off-farm sources of income of the informal credit system (See John Hopkin report, Table IX.3). The poorer producer that can not find off-farm work and has no savings is penalized by this system if he desires to increase output by buying additional fertilizer unless he can obtain credit from a merchant or friend.



TABLE 14: PEASANT UNION, FEDERATIONS AND CONFEDERATIONS BY MOHAFAZAT IN 1977

Mohafaza	Members	Unions	Federations	Confederations
Damascus	27821	244	8	2
Aleppo	31405	638	8	1
Homs	21496	360	6	1
Hama	34931	319	5	1
Lattakia	14257	265	4	1
Deir-ez-zor	23853	129	3	1
Idleb	27392	386	5	1
Al-Hasakeh	20988	349	4	1
Al-Rakka	10994	146	2	1
Sweida	11557	129	3	1
Dar'a	9246	132	2	1
Tartous	28154	291	5	1
Quneitra	<u>5171</u>	<u>49</u>	<u>2</u>	<u>1</u>
TOTAL	267265	3432	57	14

Source: CBS, Statistical Abstract, 1978.

4. Each cooperative member has to produce so many dunums of each crop specified in the plan in such a fashion that the assigned production for the cooperative is attained.

5. If a crop is planted and does not give a good stand and there is still time to plant another crop, the plan can be modified. Plan modification is frequent on some crops. For example, sugar beets are planted before the normal planting time for cotton. If the sugar beet seeds fail to germinate, it is not uncommon to modify the plan to produce cotton. Some ingenious devices have been used to assure that sugar beet seed do not germinate properly.

6. However, if the cooperative/Peasant Union leadership decides that a given producer is deliberately not following the plan, his land can be taken over for one crop cycle. The cooperative members work the land according to the plan. When the crop is sold, the cooperative repays the agricultural bank, pays the cooperative members for their labor and gives to the owner 50 percent of the profits. When this occurs, the cooperative strives to maximize profits so as to convince the recalcitrant member that he can make a good income by following the plan.

7. All licenced crops are collected at harvest by the cooperative and sold through the specified marketing organization. Each member is reimbursed according to weight delivered and not quality. Quality is judged on the entire cooperative production. This is particularly important on crops like cotton and sugar beets where bonuses exist to try and encourage good management techniques on the part of all members.

### 3.7.2 The Peasant Union as a Vehicle for Creating Class Consciousness

One of the major aspects of the Party is to work through the Peasant Union to "strengthen class consciousness and implant national socialist struggle among its members" (Bakkour, 1978). In practice, this is supposed to be accomplished via the youth organizations, the women's organizations, and the literacy program for adults. Another important program for youth is the public elementary school compulsory education system.

However, up to now there are only six producer cooperatives in the entire SAR. This fact does not indicate that the tendency is not toward producer cooperatives but, rather, indicates that the movement is proceeding at a slow pace. My interviews with agricultural producers that have been beneficiaries of the agrarian reform indicate that they still have a deep involvement with private property.

For example, in interviewing cooperative members who have received land under the agrarian reform, they insist on these major points:

1. The direct producer knows what and how to produce on his own land.
2. The plan is too general and doesn't take into account the material conditions of production that vary from plot-to-plot (water level and availability, type of soil, drainage and rainfall).
3. The direct producer should plan and not the Ministry of Agriculture and Agrarian Reform.
4. Collectivizing their plots will destroy worker initiatives.

Whether right or wrong, this is what the agricultural producers say.

Based on these statements and given the resistance to the middle Euphrates Basin land reclamation and the labor recruitment problems on the State farms, it would appear that collectivization of agricultural production under producer cooperatives will be a long process. It may even require a generational change if left to voluntary reforms.

The Peasant Union is aware of these resistances and is developing ways of overcoming them in some areas. For example, in Al-Rakka Mohafaza, the Peasant Union organized a field day in Rakka the last week in May to visit two farms growing sugar beets. The union leadership carefully selected a well-managed crop and a poor field. After visiting the two plots, they conducted a seminar on why the difference between the two plots. The well-managed plot owner received an award of a transistor radio and tools.

The same union also organized a visit to the Homs sugar beet factory and the Ghab sugar beet producers. The visit was arranged for forty people. The union carefully selected 20 good producers and 20 poor producers to make the trip. The hope was that the 20 poor producers would be encouraged to increase productivity.

These are slow and careful steps that may produce some payoff in terms of raising the consciousness of the agricultural producers. But it is also difficult to reproduce on a national scale to such an extent that voluntary participation in land collectivization programs will increase rapidly. But as the vice-president of the Peasant Union in Rakka said, "The first year of school is always the most difficult. We are still in the first year."

### 3.7.3 Some Tentative Conclusions and Recommendations

My observations on Syrian agriculture lead me to the following tentative conclusions:

1. The social relations of village life are becoming monetized. Thus, the maximization of family cash income is the key decision-making criterion for the distribution of family labor.

2. In many areas, most agricultural labor is provided by women and children, with adult men working at least part of the year off-the-farm.
3. There are a wide range of alternative sources of income for many rural residents both inside and outside of Syria.
4. Working off-the-farm for a high cash income is sometimes preferred to increased agricultural productivity.
5. This creates labor scarcity in agriculture during certain times of the year.
6. Mechanization could reduce the demand for labor in agriculture but it cannot proceed further without changing land holding patterns and finding an alternative to small plots with basin irrigation.
7. There is still effective rural resistance to producer cooperatives and State farms. As long as workers have employment alternatives, labor recruitment for State farms will be difficult.
8. The combination of these factors make the rural sector of the SAR very dynamic and increase the problems of planning. Many times the conditions have changed by the time the plan is constructed. Decisions about labor availability, wage rates as a form of incentive to keep labor power on the farm, price incentives to increase production and productivity have to be based on known facts. By the time these facts are gathered and analyzed and ready to be used as a basis for planning, labor and savings have already been distributed in another fashion.
9. This dynamic is unclear in terms of what direction it is moving toward, but it seems to involve,
  - a. the sale of labor power outside of agriculture with the income earned returning to the village in the form of new houses, purchase of cars and tractors, the establishment of small businesses, and the purchase of more land when this is possible;
  - b. creating conditions that make it desirable to establish a farming enterprise (in terms of what to produce and how to produce it) that can be managed at a distance so that family labor can be distributed off-the-farm (e.g., fruit trees, dry land wheat, purchase of non-reformed land and exploiting through share rental arrangements) wherever possible; and



- c. establishing the basis for even greater social differentiation (increasing the gap between rich and poor brought about by unequal capacity to respond to these off-farm work alternatives) in the village instead of equalizing income and opportunities.
10. This dynamic is hard to incorporate in a five year plan but it has to be recognized as part of Syrian reality if it is to be controlled. The plan could place limits on this differentiation process.

Some tentative overall recommendations may be stated as follows:

1. Give more and earlier participation to direct producers in the formation of production goals. Instead of allowing producers to react to the plan, allow them to participate in overall production goals and how to attain them.
2. The national production needs should still determine the parameters of the plan and producers should be assisted in developing a clearer understanding of national and international constraints on the planning process.
3. This could increase understanding of the overall political economy and bring about awareness of the need to collectivize if this continues to be one of the planning goals.
4. Retain labor power in agriculture by increasing wage and other incentives on the State farms, and increased prices for agricultural commodities insofar as this does not critically increase the urban wage food bill, and improved social services to rural villagers. In effect, this calls for reducing the amount of surplus transferred out of agriculture in the short run, but long run increases in productivity and participation in the planning of the production process could establish a new social basis for future growth.
5. Recognize that the rural producers do not resist mechanization per se but do resist a change in land holding patterns which effectively limit the mechanization of harvest. Careful attention to the need for greater national and collective consciousness must be established if this is to be accomplished voluntarily.
6. An alternative to the above-mentioned recommendations is to privatize the agricultural lands except on the land reclamation projects. This would increase the social differentiation process, work against equity and the goals of socialism.



CHAPTER IV

BEDOUINS IN AGRICULTURE

By

Andrew Manzardo

TABLE OF CONTENTS

	<u>Page</u>
Preface	ii
1. Introduction	1
2. The Traditional Life of Bedouin Groups	5
Consanguinity	5
Common Interests	6
A Homeland	8
Political Authority	8
Religious Leadership	10
Interaction with Non-Bedouin Groups	10
3. Environmental Constraints and the Interaction between Nomadic and Sedentary Groups	12
4. The Development of a Governmental Policy toward the Nomadic and Semi-Nomadic Groups	15
5. The Present Policy of the Syrian Government toward Nomadic and Semi-Nomadic Peoples	22
6. Programs for Mobile Populations in the Syrian Arab Republic	24

(Continued)

7. The Sheep Cooperatives	26
The Origins and Policies of Sheep Cooperatives	26
A Measure of the Success of the Supplemental Feed Program	29
The Territorialization of the Cooperatives and the Conservation of the Steppe	30
8. The Limitation of Movement and the Delivery of Services	32
9. Communication and the Problems of the Steppe	37
10. Bedouin and Other Sectors of Syrian Life	38
11. The "Middle Path" Bedouin Policy of Syria	41
12. Conclusions and Recommendations	45
Social Service Delivery	45
Range Improvement Programs	46
Overall Programming--Comments and Ideas	46
Bibliography	51

### PREFACE

I would like to thank Mr. Hussain Sarakby, who accompanied me on my tour of the Steppe in June 1979 and answered so many questions. As Director of the Wadi al-Azib Centre, Mr. Sarakby has shown himself to be a dedicated worker and a man who is welcome in every tent in the Steppe. I would also like to thank Mr. Abdullah Masri, Director of the Badia Directorate of the Ministry of Agriculture and Agrarian Reform, and his staff for taking the time to provide enlightenment on the problems I encountered and for helping to arrange the logistics of the tour.

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## 1. Introduction

Boykin and Khoury (1979) have noted that the value of animal production accounted for 27% of the total value of animal and crop production in the Syrian Arab Republic (SAR) in 1977. Much of this production is the responsibility of nomadic and semi-nomadic peoples who raise sheep in the steppe (sheep production accounts for 70-75% of all animal production in the SAR). These nomadic and semi-nomadic populations have been popularly termed the "Bedouin."

According to Nyrop et al., the population of "Bedouins" in 1965 amounted to 7.4% of the total population of Syria (1971:26,73). Table 1 shows that this population is concentrated with one section of the country, commonly called the badia (the steppe or desert) from which the word "Bedouin" is derived. The boundaries of this desert or badia region are commonly defined as:

east of a north-south line from the eastern hills of Horan through the villages of Kariatain, Slaimieh, and Tal Abiad, meeting with the Syrian-Turkish border and ending with the Wadi Tigris (UNESCO 1970:108).

Some of the Syrian badia provinces have a larger number of Bedouins than others. For example, in Al-Rakka Province, where 59% of the land is used for pasture, 26% of the people are termed pastoral, a group "composed of a number of tribes whose primary occupation is animal husbandry" (Chatty 1978:69).

Bedouin populations are not limited to Syria. These peoples live within a wide geographic area which includes the arid and semi-arid areas (below 10" of rainfall per year) of Syria, Iraq, Jordan, Kuwait, Saudi Arabia, as well as much of North Africa. According to Lamb, the Bedouin probably make up around 6% of the total population of West Asia, although their numbers are shrinking. In Saudi Arabia, for example, the rate of decline is around 2% per year (Lamb 1979:K3). A similar situation probably exists in other countries as well.

The terms "Bedouin" and "nomad" are not interchangeable. A UNESCO report notes that:

Bedouin, derived from the Arabic expression badu (singular badawai), is a general term for all tribesmen that live in the desert (Arabic: badia) and live mainly on herds of camels, cattle, sheep, and goats with some horses and donkeys. Bedouins are, however, frequently classified into three groups in accordance with their traditional degree of nomadism: (1) nomadic, (2) semi-nomadic, and (3) sedentary (UNESCO 1970:105).

This means, therefore, that not all Bedouin are nomadic; some lead a more stable existence living as villagers or at least spending part of each year in settlements of a more permanent kind.

Table 1  
Population of Bedouin Groups by Mohafaza for 1965

Mohafaza or Province	Number of Tribes	Population	Percentage of Total Population
Jezireh	11	165,251	3.6
Damascus	8	30,450	0.7
Jabal al-Druz	6	8,745	0.2
Homs-Hama	8	78,481	1.7
Aleppo	<u>5</u>	<u>57,222</u>	<u>1.2</u>
Total	38	340,149	7.4

Source: Faiez Taei', "Sedentarization of the Nomadic Population of Syria," Meeting of Experts in the League of Arab States on the Settlement of Nomads, 1965, pp. 20-21 (in Arabic)--quoted in UNESCO 1970:108.

On the other hand, not all nomads are Bedouins, at least as the term is commonly used. The term "Bedouin" implies membership within one of several Arabic tribes. In Syria, the names of the largest Bedouin tribes are: Ruwalla, Hadeedien, Mawali, Beni-Khaled, Sbe'aa, 'Emoor, Fed'aan, 'Afadla, Shammar, and Jeboor.

There are several groups of nomads who are not "Arabs," such as the Kurds and Turkomans. For this report the term "nomad" will be taken to include these groups, while "Bedouin" will include only the nomadic and semi-nomadic Arabic-speaking populations, either members of the tribes listed above or sharing cultural similarities with those tribes.

The classic nomadic Bedouins have:

no permanent residence [and live] exclusively in tents. They roam the desert seeking water and pasture for their flocks, which are composed mainly of camels. Their only income is from the milk and meat of their herds. Though they may have rights of usufruct in the communally owned tribal land, they take pride in their livestock rather than the land. The tribal organization is strong, and their wealth is reckoned mainly in camels (UNESCO 1970: 105).

Nyrop et al., however, state that this way of life is decreasing, noting that:

The number of actual nomads among the tribesmen is steadily decreasing because of both government settlement policy and erosion of their economic base . . . (Nyrop et al. 1971:73).

The decline of the Bedouin and his nomadic way of life is part of a longer historical process, which we will explore in some detail below. Lamb sums up the situation when he notes that:

A common theme in Arab history has been the hostility between the settled peoples and the Bedouin, whose wandering life-style, different property values and apparent lawlessness made them a people apart, a people to be feared. Once, the Bedouin had been powerful enough to exact tribute from settlements in return for protection. But today the roles have been reversed and it is the sedentary Arabs who control the destiny of the nomads. In their eyes, the Bedouin have no role in a modern society and no further contribution to make to national development (Lamb 1979:K3).

While the last statement is in measure an exaggeration, it represents one side of an ambiguous attitude toward the Bedouin in Syria. The complexity lies in the fact that while many feel that the nomadic way of life is primitive and will be eliminated as the country develops, at the same time the many Bedouin values permeate Arab society as a whole and Syrian



society in particular. These values are recognized as being Bedouin in origin and cherished for this reason, associating the urban Arab with a romantic, perhaps mythical, but valued past (cf. Chatty 1978:55-63 for a specific discussion of these values and their source).

The growing sedentarization of Bedouin groups in recent years has increased the number of tribesmen who are involved in agricultural pursuits during some portion of the year. Some government officials have gone so far as to say that the only true nomads remaining in Syria are the gypsies, and a few Bedouins who wander in from Jordan or Iraq. It is doubtful, however, whether anyone knows the extent of Bedouin devotion to agriculture.

According to the UNESCO report,

the semi-nomadic, or half-settled groups undertake some shifting agriculture in the rainfed areas and have fixed autumn residences in villages and oases; they sow their crops from November to January and harvest them from May to June, leave their farms during the off-farming months and live in tents on the dry land within or outside the tribal territory, seeking water and pasture for their flocks which are composed mainly of sheep. Their main income is from their herds, but farming provides them with a supplementary source of livelihood. If they have no herds they may take casual employment anywhere, sometimes as shepherds for other livestock owners . . . (UNESCO 1970:105-106).

If one looks at this way of life as a direct response to a specific set of environmental demands, learned over the centuries and modified to reflect the minute changes in that environment (on the historical scale at least) which occur over time, one can see that it is a way of life which is finely tuned to satisfy human needs within a marginal environment. Government programs must be looked at as alternatives to these long-standing patterns. The success or failure of such programs must be judged on how well they satisfy these needs.

Boykin and Khoury present an analysis of the present condition of the steppe and the effect of human action upon it. For various reasons, the ecological balance of the steppe is no longer being maintained. Should the Bedouin continue their present activities at present levels, in a number of years they will have caused the steppe and their own social fabric irreparable damage. The traditional social system has already been fundamentally transformed and cannot be thought of as an alternative to government programs in terms of providing many basic services filling many needs. One can only look at the past traditional ways of life to understand what traditional needs still exist and how these needs were once met in order to assemble some clues to how needs may be met in the future.



Boykin and Khoury have looked at many of the same public programs that I will discuss. Although it is recommended that the reader look at their analysis of biological and ecological factors in these programs, this study analyzes these programs as social systems, as experiments in different ways of meeting human needs.

The report which follows attempts to describe the "Bedouin Policy" of the SAR and how well this policy meets the needs of nomadic and semi-nomadic peoples. First, the traditional social organization of the Bedouin will be briefly presented to provide a context as well as to understand how this organization has served to meet human needs within a difficult set of environmental constraints. Second, the effects of this way of life on neighboring agricultural communities will be explored, in order to understand how the competition for resources has led to certain policy responses from the state. These alternative policies will be briefly explored. Third, the present policies of the Syrian Government toward Bedouin and other nomadic or semi-nomadic groups will be explored. Finally, some notion of the adequacy of these programs will be attempted on the basis of actual field visits.

## 2. The Traditional Life of Bedouin Groups

Although Bedouins are usually classified into three general types (nomadic, sedentary, and semi-nomadic), this classification in actuality should only be taken as indicative. According to UNESCO:

The simple truth is that between most nomadic Bedouins on the one hand and the sedentary cultivators on the other there is a continuum of all degrees and forms of nomadism (UNESCO 1970:106).

Throughout this continuum there are similar social structural features shared by all nomadic and semi-nomadic Bedouin groups. A brief review of features of nomad social organization taken from the ILO report (1964) as well as several other sources is as follows:

### 2.1 Consanguinity

Bedouin kinship groups have a strong patrilineal, patrilocal, and paternal organization\* with all members tracing descent from a single ancestor, often a mythical clan founder, an outstanding man of faith, or a great warrior. This consanguinity, whether real or a fiction, plays a major part in defining the group, and as a result, marriage and the rules of marriage are especially important in Bedouin society. Many

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\*Patrilineal refers to a group tracing ancestry only through the father's side of the family (patriline), while patrilocal refers to the preferred residence of a new couple after marriage, in this case in the boy's father's home. Paternal refers to a society dominated by older males.

Bedouin groups, including those of Syria, stress endogamy (marriage within the group) and prefer marriages between a boy and the daughter of the boy's father's brother (parallel cousin marriage). This preference encourages marriages between those who have the same clan name, a form of marriage not permitted in many other societies, including most Western groups. At the same time, this type of marriage maintains rights and property within a small social group and strongly maintains the integrity of social units. This type of preferential marriage does not, however, mean that other types of marriage cannot and do not take place. It is still felt, however, that:

Marriage outside tends to disperse the wealth of the group by transferring it to strange hands through inheritance. Thus, in a nomadic society where the general tendency is to migrate and to move about, endogamy counter-balances the dispersal of the kinship group and acts as a factor in maintaining its cohesion and solidarity (ILO 1964:68).

## 2.2 Common Interests

The Bedouin kinship groups act as corporate economic units, that is, they hold and manage property in common. They act as administrative units as well. Each group level, however small, has its own agricultural and pastoral land within the larger tribal territory for which it has both rights and responsibilities. Members of these units are entitled to certain watering places and usually arrange for the migration of their flocks to certain specific pasture lands.

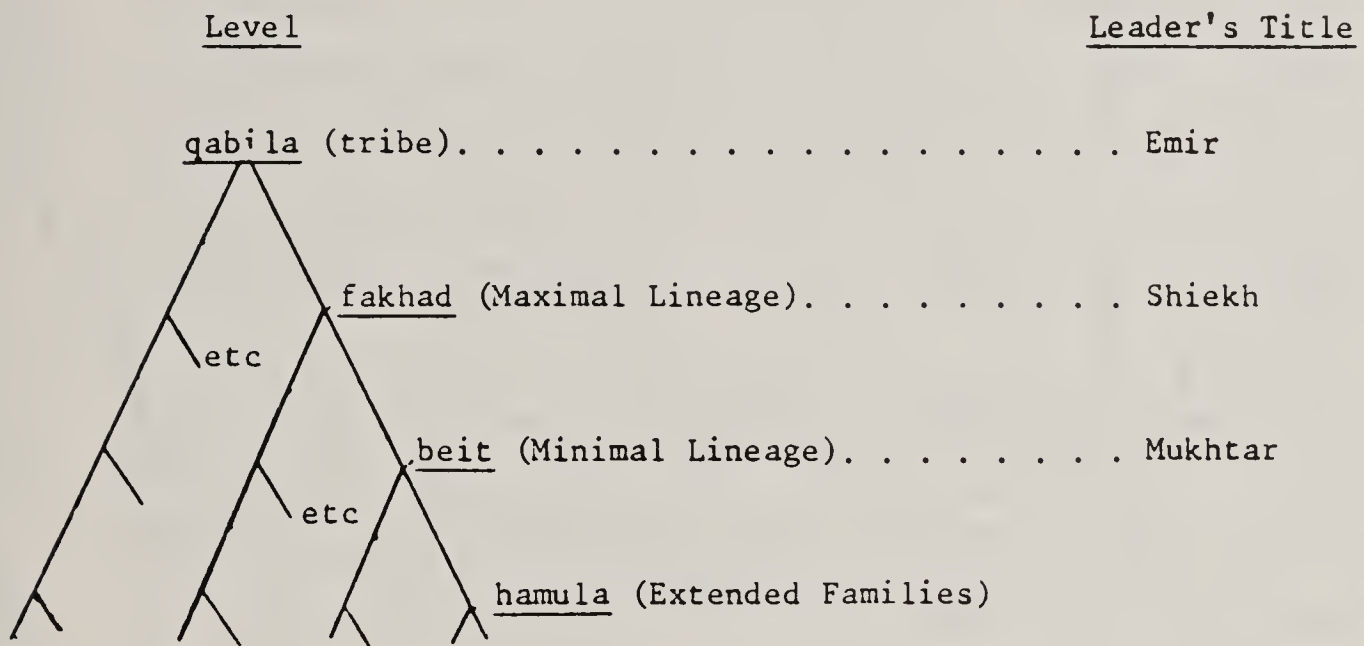
The social organizational system is segmentary, which means that small but closely related independent social groups can join together and form larger, cooperating groups. These higher-level groups can then join with other closely related high-level groups to form still larger, even higher-level groups to deal with greater problems. The workings of such segmentary systems is illustrated by the widespread Arabic saying,

I against my brothers,  
I and my brothers against my cousins,  
I and my brothers and my cousins against the world.  
(See Chatty 1978:39-41; Evans-Pritchard 1949:59-60.)

This allows a great deal of flexibility within the system. At times, small and independent units can exploit limited resources within a territory with no fear of competition from other nearby, related groups. If there is conflict, that conflict can be resolved, as we shall see below. If there is a threat on the group's territory from the outside, the segments can join to form a group large enough to meet the outside threat. Figure 1 shows the various segmentary units of kinship as they appear in Bedouin society in Syria.

FIGURE 1

Schematic of the Khamseh or Segmentary Alliance Structure



(See Chatty 1978:41-45.)

At the same time, it must be remembered that in traditional society, the right to administer land forms a necessary obligation to take responsibility for that territory. The techniques of land administration and range management which up until recently were a part of this traditional Bedouin system were well developed. Draz, for example, has recognized these techniques, calling them the "Hema system" (see Draz 1977). It should be stressed, however, that such a system only works within a larger set of social responsibilities. When these rights and obligations are gone (as we shall see) the "Hema system" will no longer operate.

### 2.3 A Homeland

Although nomads may emigrate for long periods to distant places and are almost always fractionized into the small groups within the segmentary system, they follow well-defined routes on a fairly fixed annual cycle, and return to the point from which they start. They consider as their "home" their original place of residence. The cyclical nature of the movements of semi-nomads in Syria is demonstrated in Khoury's map (from Boykin and Khoury 1979), reproduced here as Map 1.

The UNESCO report gives the example of the Ruwalla tribe living to the east of Damascus who begin to trek early in September to spend the winter in the Syrian desert. The spring is spent in the oases of Jauf and Tayma in northwest Saudi Arabia. In the summer and early autumn they return to their "homeland." Their total nomadic area is about 500 miles north and south and about 300 miles to the east and west. Their erratic course means that they travel about 1,500 miles per year.

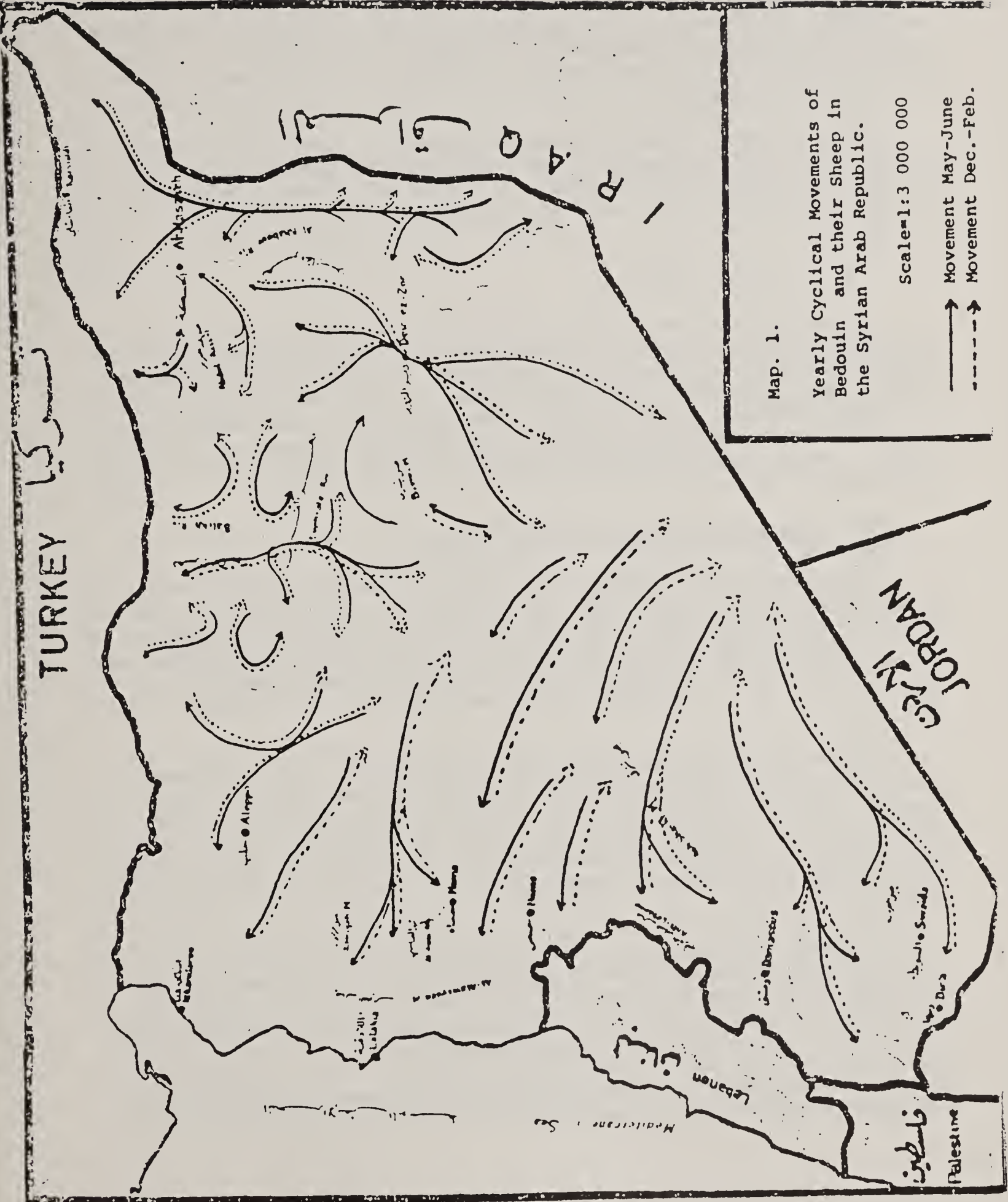
### 2.4 Political Authority

Although the tribe (qabila) does not function as a social or political unit in daily life, it is a unit which can make itself felt when tribal interests, especially lands, need to be defended. At each level of society (see Figure 1), authority is assumed by the leader of that unit, which is economically independent and politically independent in daily life. It is only when conflict creates an insoluble problem that appeal to higher authority is relied upon.

Although traditional tribal authority has been reduced or coopted by the state to some extent over the last fifty years, the chief or emir of the tribe traditionally had the right to (a) plan the movements of the tribe to grazing lands, (b) settle internal disputes, (c) declare war on or conclude peace with other tribes, and (d) collect taxes on behalf of the Government from his own tribesmen.

The tribal chief or emir is then considered the highest authority within the tribal society. Some central governments in the region have tried to utilize this power position by attempting to appoint their own allies as chiefs. This tactic seldom worked, for it generally created a situation where tribesmen gave lip service to the appointed chief, but went to the man they considered the rightful chief to solve the problems of consequence within the group.





Map. 1.

Yearly Cyclical Movements of  
Bedouin and their Sheep in  
the Syrian Arab Republic.

Scale=1:3 000 000

→ Movement May-June  
---→ Movement Dec.-Feb.

According to some sources, the heads of each level of the segmentary system (emirs, shiekhs, etc.) do not have so much outright, unchallenged power as they have influence. Influence is brought to bear on a council (or majlis) which is composed of all the adult males of the unit. According to Nyrop et al., it is the "views of the most senior and respected members [that] carry the most weight" (Nyrop et al. 1971:75). The council is held periodically in the guest tent of the section head to discuss all matters of importance.

Other groups of nomads and semi-nomads such as the Kurds and Turkomans utilize what is essentially the same political system, with different titles for their leaders. Their political and economic units are usually much smaller than those of the Bedouins, at least in Syria (ibid.).

## 2.5 Religious Leadership

In some groups there exists a category of religious leaders that exerts considerable authority in addition to the tribal leaders and their majlis. These leaders exert more subtle but at times more effective influence than the designated political figures. Their religious concerns and responsibilities carry a certain "disintegrated" flavor where personal gain is not at question (cf. Chatty 1978:27-37; Nyrop et al. 1971:81-100). These leaders "play an important role in settling disputes and, consequently, in keeping social equilibrium" (UNESCO 1964:74).

## 2.6 Interaction with Non-Bedouin Groups

The notion of the Bedouin being self-sufficient and self-ruling is belied by extensive interactions which the Bedouin have both with urban merchants and with farmers. The interactions with agricultural groups will be discussed in the next section. The interaction between Bedouins and especially semi-nomadic Bedouins and urban merchants should be briefly discussed in order to paint an accurate picture of Bedouin life in the SAR.

Sheep raising has always been a good speculative venture for merchants living in the cities near the steppe, such as Homs, Hama, and Aleppo. It is for this purpose that the traditional alliance between semi-nomads and merchants was established. The merchants provide the capital to buy the sheep while the Bedouins provide their labor in watching over the sheep and their knowledge of the steppe to ensure their survival.

Merchants buy the sheep in July, just before the breeding season. They are then taken out to the steppe by Bedouins for six months. Then the sheep are brought into the cultivated area for six months to graze on stubble or in fallow fields as they become available. A complex partnership has by that time been established. Typically, the value of the wool, milk, and ghee go to pay back the merchant for his initial investment. Once this original investment has been recouped, the merchant and the Bedouin become partners and share the remaining profits fifty-fifty.

It is difficult, at present, to establish the average holding of sheep for Bedouin families and the average income from these sheep each year. The best figures we have to go on are from Chatty (1979) and Bakour (1976). The number of sheep per household depends largely on wealth (and conversely, wealth depends largely on the number of sheep), but there are other factors as well. Most important of these are the ecological and political variables which determine where the family lies on the continuum between nomadism and sedentariness. Thus, not all the households in Mansourah village in Al-Rakka, which is largely agricultural (the Bedouins having settled there about 80 years ago), have sheep and goats. Out of 30 households, only 14 have sheep and goats, the total numbering only 154, or an average of 11 head per livestock-owning household. On the other hand, the village of Dja'din, also in Al-Rakka, about 20 km. away from Mansourah, has a population which consists of 50% semi-nomads. Here the average holding is about 157 head per family (Bakour 1976:15, 23).

To calculate the income from livestock, Chatty gives a figure of Syrian £50 per head for the sale of wool, milk, cheese, and ghee (samneh). The population of Um Madfah in Al-Hasakeh, for example, roughly averages around 80 head per family which results in an annual income of around Syrian £4,000 per year from livestock. Chatty adds an estimated Syrian £2,000-3,000 per year as income from agricultural pursuits in addition to this. These figures help establish a general area for the mean holdings.

Relationships between specific Bedouins and specific merchant families have been established over generations. When it is time to purchase sheep, the merchant seeks out the advice of a particular Bedouin and takes him to the sheep markets of Homs or Hama. He would never consider buying sheep without the advice of his partner. At the same time, the Bedouin seldom sell sheep or their products outside of the markets in Aleppo, Homs, Hama, Dier-ez-zor, or Tudmore. They are often suspicious of prices which emerge outside of the known market.

The segmentary social features associated with the Bedouin traditional system, as well as that of the Turkomans and the Kurds, maximize the groups' security from outside raids. At the same time, the system has permitted the day-to-day operation of small groups, minimizing the burden on any one area of the tribal territory by allowing flocks to be broken up into small units. Moreover, the system has provided a means of settling disputes between these small and independent units so that the solidarity of the whole is never threatened. Each segment of the group takes responsibility for a section of the tribal land and thus the integrity of the whole is maintained through the traditional Hema system. Since a specific group is responsible for a specific area, the problem of the "commons" (see Hardin 1968:31-50), where "each man is locked into a system that compels him to increase his herd without limit in a world that is limited," essentially does not exist.

Land, rather than being theoretically open to all, is open only to a limited family group. Within the group, small units are given usufruct



rights to small sections of that territory, as we have mentioned. It is only in times of hardship that other closely related groups will be tolerated on one group's territory.

The combination of limited access to the land and assignment of responsibility for the maintenance of that land under a traditional system of range management (the "Hema system") has, in previous centuries, kept the range from deteriorating. As Draz points out, when that system disintegrated (not merely through the elimination of the Hema system, but through the loss of its larger context of social responsibilities as well) it was the lack of property rights and the instability of life, not the forces of nature, which resulted in overgrazing and the misuse of resources. In other words, the closely regulated ownership pattern was replaced with a lack of regulation which has resulted in tragic environmental degradation.

Draz stresses the importance of:

studying the human factor in relation to land use and land tenure, numbers of grazing animals and that unless recommended practices are acceptable to the people and in harmony with their customs and way of life, the whole programme of improvement is bound to fail (Draz 1977:8; also cf. 1969).

### 3. Environmental Constraints and the Interaction between Nomadic and Sedentary Groups

The Bedouin social adaptation to survival in a marginal environment produced the traditional system of land maintenance (the Hema system) and land responsibility (through tribal territoriality) which no longer operate as in previous times. The cause for the dramatic weakening of this system can be traced to problems inherent in the relationship between nomadic, tribal, husbandry-based societies and sedentary, agricultural, village-based societies. The section which follows will present a short discussion of this interrelationship and its eventual effect on the policy of the Syrian Government toward nomads and semi-nomadic groups.

Nomads traditionally interfere with the smooth operation of an agricultural society. They prey upon the communications and trade routes of the state, they occasionally raid agricultural villages or charge them tribute for protection (called khawa), and they have blood-feuds which interfere with the lives of others and present security problems. Bedouins and other similar groups are largely illiterate (the 46.5% male and 83.2% female illiteracy rates in Syria include many of the Bedouins, as does the 43.5% out-of-school youth; cf. UNICEF 1969). They present a medical problem to sedentary populations as well, for their lack of access to modern sanitation and medical care makes them hosts to cerebral meningitis, relapsing fever, malaria, bilharzias, and once to smallpox as well (cf. Khattat 1961). In addition, typhoid, typhus, venereal disease, and nutritionally based diseases (tuberculosis



in 1958 affected 25% of the Bedouin population in Syria, hemorrhoids 70%), as well as measles, skin diseases, ophthalmia, and diarrhea, are also widespread and bring misery to the lives of the Bedouins themselves (ILO 1964:116). All of these factors provide the potential for conflict with sedentary peoples.

In most areas, farmers and pastoralists settle in different types of resource niches. The farmer requires water, either through rainfall or irrigation. Without this water, crops will not grow. Although the pastoralist requires water as well, he can survive in areas that are too dry for cultivation. These areas often have different types of soil configurations as well. Hyams points out that "grass soils," for example, occur where there is less than 10 inches of rainfall per year. It is the grass cover of this soil alone:

which enabled them to maintain their stability during thousands of years in such arid conditions. Every drop of water was absorbed and held in the vast sponge of the grass-roots. But once ploughed, the soil had no means of retaining water. In years of subnormal rainfall, the crops simply perished . . . [monoculture and artificial fertilizer combined with] . . . a couple of drought years in succession and a couple of weeks of high wind, had had its inevitable result [the U.S.'s Great Dust Bowl] (Hyams 1952:148-149).

Draz notes that:

The debate on feasibility of cultivation of arid lands for grain production has been going on for years. The ancient inhabitants of the Arabic Peninsula were aware of the destructive role of the plough on the natural vegetation in arid areas. . . . Mohammed the Prophet (more than 1300 years ago), who although a supporter of agricultural and land reclamation, had 'warned those who encroach with their ploughs on boundary lines of land not permissible for cultivation'; emphasizing that 'ploughing under such conditions would bring forth humiliation' (Draz 1977:19).

He also notes that:

Marginal lands are being utilized [in Syria] for grain production. As a result, the pace of erosion is accelerating and vast areas of rangeland are lost annually to desert (Draz 1977:4).

This arid land, which is not suitable for cultivation without very special techniques, extends from Syria northeastward to take in a large portion of Iraq, Iran, Afghanistan, the Soviet Steppe, Tibet, and other parts of the People's Republic of China. This area is still the home of great numbers of pastoral tribesmen who share many similarities in their

way of life. On the fringes of this land, however, there is land which is suitable for farming and much of the history of the region is written in terms of the waxing and waning of one group or the other according to changes in their control over these lands. As Bates puts it:

Patterns of mutual land use between ethnically distinct nomadic and sedentary agricultural populations occur in some areas of the Near East. The niches occupied by such groups may appear to be non-competitive in that different schedules of land use and different modes of production permit the joint exploitation of common territory. However, such land use relationships are inherently unstable because the limits of the political economy of either ethnically defined mode of production are rarely coterminous with the distribution of the resources a population could exploit if it had access to them. Therefore, it is contended that peasant-nomad expressions of land use mutualism and symbiotic exchange are best viewed as a function of balance of power, and not as a result of the exploitation of intrinsically non-competitive niches (Bates 1971:109).

Bates gives examples of three types of interactional systems based on different ecological or resource bases. One model, based on the Yoruk Mountain Pasture Nomads, need not concern us here for it focused on high altitude systems not present in Syria. The second system, the large-scale river valley or irrigated agricultural system, is of interest since it deals with the situation found along the Euphrates River. In such a system there is a clear boundary between the cropland and the surrounding desert where "there is little fringe area capable of supporting nomadic small animal husbandry." Pastoralists (in this case, camel pastoralists) tend to deal directly with the central government agencies. The government function is to act as a buffer between the peasants and the Bedouin "forces from the outside." Bates points out that in this case the disparity in the size of the groups makes the pastoralists' demand for agricultural products negligible on the system. Potential for complete mutuality is therefore quite low in this area.

The third system within Bates's interactional model, the rainfed plains agriculture system, is based on data obtained on the north Syrian steppe. This steppe (rainfall of approximately 8" annually) "marks the limit of grain agriculture to the peasant farmer, it also represents prime grazing to a great variety of nomadic pastoralists." The Turkomans and the Kurds have used this land for winter grazing grounds, while the Arabs living on the fringes of the Syrian desert use the land in summer as well as for winter grazing.

In this plains area, the relationships between the pastoralists and the state are defined, as influenced by the strength and vitality of agricultural interests and the state itself:

Scholars dealing with the Levant have been careful to note the positive correlation between the strength of the sovereign central government and the expansion of grain agriculture into the desert periphery, paralleling the sedentarization of former pastoralists (cf. Sweet 1960). . . . Presumably a reverse trend is possible in times of governmental weakness, although it is little documented in literature (Bates 1971:120-121).

The growth of sovereignty of central governments in the area is related to the weakening of the Bedouin customary law along with their loss of independence and growing sedentarization. It is Bates's point, however, that an equilibrium is established between grain producers and pastoralists. The point of balance in this equilibrium influences, and is influenced by, how power enters the system from the outside. We are concerned therefore with the role of government policy in tipping the balance of that equilibrium.

#### 4. The Development of a Governmental Policy toward the Nomadic and Semi-Nomadic Groups

According to the report of the ILO:

Until recently, the nomads and to a lesser degree the semi-nomads have been a state within a state. They enjoyed a privileged and special status in their respective countries. They had their own customary tribal law, with their own chiefs and tribal courts, and they were exempted from military service and taxes. The tribe constituted an autonomous political entity which could wage war and organize raids or conclude peace with other tribes, thus presenting a real source of unrest and a continuous menace in the desert (ILO:1964:76).

This "desert menace" was felt in modern times by the Ottoman Empire, which conquered Syria in 1517 A.D. According to Bates, the

Ottoman pashas sent out from Constantinople had a free hand in governing their districts during their short tenures and normally operated through local chieftains to collect tax levies in kind. However, frequently a tribe would be paid by the government to maintain security and trade (Sweet 1960:43). In the nineteenth century, the Ottoman began a program of agricultural development and forced settlement of nomadic groups. Apart from Midhat Pasha, such governors as Dervish Pasha and Cevdet Pasha were extremely effective in settling Kurdish, Arab and Turkoman tribes by bringing the full brunt of



the military to bear on individual tribes while at the same time offering tribal leaders title to large tracts of land. Peasant groups from elsewhere, including Circassians, were settled in the area (Bates 1971:121).

The Ottoman policy toward nomadic and semi-nomadic peoples is the oldest and most often repeated pattern of behavior of the state toward nomads. It is a policy of initial alliances with one tribe or another, followed by an attempt, sometimes successful, sometimes not, at secondary rule through traditional tribal leaders or government-supported contenders for leadership. Finally, the policy evolved into some type of enforced settlement procedure attempting to convert the nomads into sedentary agriculturalists and citizens of the state.

In the case of Syria, however, the predictably violent response of the nomads to this kind of treatment has become associated with the anti-colonialist struggle. The most famous example of this, at least to Westerners, is the Arab Revolt which took place during World War I. In that instance, the unified action of several tribes was successful in obtaining independence from the Ottomans, although not successful in resisting the French.

France essentially ruled Syria under the Mandate until just before the end of World War II, but apparently had learned nothing from the Ottoman experience and attempted to follow the same policies in regard to the Bedouin.

After independence, however, Syrian governmental policy was ambiguous. On the one hand, the central government attempted to continue the policy of trying to sedentarize the nomads and turn them into agriculturalists. On the other hand, it adopted a policy of separatism. This policy can best be demonstrated through the example of Legislative Decree No. 124 of May 21, 1953. According to that Decree, the

chief of each tribe was appointed and dismissed by decree of the Director-General of Tribes,\* the mukhtar, the chief of the tribal section was similarly appointed; or he could be dismissed on the recommendation of the officers of the tribe . . . .

Up to this point, therefore, the law repeated the policy of attempted secondary rule through appointed mukhtars and chiefs. What follows is a list of crimes which permit the central government to remove a chief or mukhtar if he proved uncooperative. At the same time,

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\*The Director-General of Tribes was the head of the General Organization for Tribes of the Interior Ministry which handled nomad policy through the reorganization of 1968.



Article 7(a) states that members of the tribes are as a rule governed by the customary law regarding their mutual relationships, and by the rules of common law relations with sedentaries. Cases of homicide come under general law (ILO 1964:83).

Although the Director-General of Tribes controlled the appointment of chiefs, he could not make the Bedouins respect their appointed leaders. A situation arose where typically two sets of parallel leaders operated within a single tribal unit, and often within a section. One leader was involved in business concerning the central government, while the other continued to run the group's day-to-day affairs. As long as the group was peaceful and stayed out of the way of the sedentary groups, it was free to take care of its own affairs.

The policies of sedentarization and separatism were bound to come into conflict, however, for separatism is hard to maintain when the needs of the nomads conflict with the needs of the state. The best example of this occurred in the Jezira and Euphrates areas. The source of the conflict was the introduction of irrigated cotton to the areas along the Euphrates basin in the 1940s and 1950s. Land which was once of little value for anything except animal husbandry became a potential source of high income for farmers and a source of revenue and foreign exchange for the state.

The land in the region was all in the hands of the tribes at that time. It was communally held land, administered under the principles stated above. To convert the land into alienable property available to farmers, it either was converted into private property or was declared state land available for land reform.

According to Hinnebusch,

In the course of the transformation of the nomadic sheep-herding tribe into an agrarian community, the tribal chief and his closest relatives were able, with the help of the old landlord controlled government, to secure the right of private property over the land assigned to the tribe as a collectivity. The tribesmen were turned into agricultural laborers and sharecroppers. In some cases, they were left without any stable means of livelihood as the chief, preferring less intractable labor than that of formerly independent tribesmen, imported submissive peasants from the West to work the land (Hinnebusch 1976:19).

Land which could not be legitimately assigned to Bedouin chiefs (under a law of 1916, according to the UNESCO report) was reassigned under land reform principles stated in the 1950 Constitution. The reassignment of land began in 1952-53 under what has come to be called the Southern Rudd Project. Under that project, nationalized land was divided into

10-hectare plots (irrigated) and distributed to poor nomads and other landless who wished to settle. Preference was given to the original inhabitants. In return, settlers had to till the land for 3 successive years and could not dispose of the property for 15 years. Taxes could not exceed 10% of the harvest (see ILO 1964:103-104).

Although the project handed out only about 100,000 hectares of land in the Jezira (less than  $\frac{1}{4}$  of the land claimed) and much of it went back to members of the Jeboor and Shammar clans, it was no longer tribal land, at least in the eyes of the government, but land with a single assigned owner responsible for raising crops and paying taxes.\*

The nationalization of the land had some negative consequences. The legal fiction of nationalizing "unclaimed" tribal range lands worked as far as finding a means to expropriate and distribute lands needed for farming, but the way in which it was done took the rest of the lands out of the hands of the traditional administrators--the tribal leaders. The separatist's policy allowing self-administration was blocked by the policy of settling the Bedouin. Traditional boundaries between tribal lands on the range disappeared when the land was nationalized. There was no longer any basis for range management. The land had suddenly become a state-owned commons.

There are traditional problems associated with commons land with which the Syrian Government was not prepared to deal. Hardin describes these problems as follows:

As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component:

1. The one positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.
2. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all herdsman, the negative utility for any particular decision making herdsman is only a fraction of -1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to

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\*Other similar projects were begun as well. The Jebel Sam'aan Project in 1958 was begun northwest of Aleppo. The Ghab Project too was originally conceived of as a Bedouin resettlement plan. There were also projects in the Jebel Druze.

his herd. And another; and another . . . . But this conclusion is reached by each and every rational herdsman sharing a commons (Hardin 1968:36-37).

The ability for the collective group to avoid the problem of collective effects of overgrazing disappeared and only the individual decision-makers remained. As Draz and others have pointed out, this "instability . . . and loss of [tribal] property rights" led to overgrazing and misuse of resources which gravely affects the steppe today (cf. Boykin and Khoury 1979).

The policy of separatism was increasingly abandoned by 1958 in a transition toward a policy more oriented to integrating the Bedouin into the national society. In this period the government introduced a new education scheme for the Bedouin. According to the UNESCO report, the plan called for the establishment of primary schools in the villages and towns where the most important clans clustered during the winter months. The plan was to recruit pupils from these clans and provide them with an education, as well as room and board to encourage attendance. Lack of funds permitted only five such schools to be organized.\* Boys were expected to spend five years at these schools, during which they were taught primary school subjects, "with more attention paid to their local environment and physical conditions." Agricultural subjects were also introduced.

Students were sent to Damascus or other large cities to complete their secondary and intermediate schooling. Fewer than the 750 pupils envisioned for this program were able to be recruited. Many of those who were recruited had to be taken by force, according to the ILO report. The likely reason for the resistance was that the Bedouins perceived that although the education was being brought to the nomads ostensibly to equip them to get along better in the modern world, that form of education could break down the traditional tribal organization through the alienation of the young and by changing

many of their traditional habits and values. . . .  
accustom them to the national patterns of behavior  
and modes of thought (ILO 1964:119-120).

Moreover, this education effort concentrated on the children of the Bedouin leaders, to create a class of educated (and coopted?) chiefs for the next generation. The remainder of the Bedouin children were left without any arrangements for their education.

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\*These were at Domair for the Ruwalla clans, Ma'arra for the Hadeedien and Mawali clans, Tudmor or Palmyra for the Beni-Khaled clans, Sbe-aa clans and the 'Emoor clans, Rakka for the Fed'aan and 'Afadla clans, and al-Hasakeh for the Shammar, Jeboor, and other Jezira clans.



The remnants of the policy of separatism and the limited resources of the country at that time delayed the start of any medical facilities. According to ILO:

the few hospitals and public health centers established at widely dispersed locations are not well-equipped with enough beds to receive patients or with the necessary and essential medicines. . . . For example, the Raqqa region in Syria, with an area of about 400,000 square km. and a population of some 126,000 people (of whom 35,000 are nomads) had in 1958 one public clinic with one physician and one male nurse. Several cases had to be referred to hospitals in Aleppo, about 200 kilometers away. There was not a single pharmacy in the whole region and all medicine had to be brought from Aleppo (ILO 1964: 115-116).

The policy of separatism was rationalized by assuming that the nomads

have much more faith in their folk medicines and prefer remedies such as cupping, massage, cicatrization, the use of herbs, etc. Modern hospitals, medical practices and trained doctors are regarded with much suspicion (ibid.).

This attitude shows that the policy of separatism was extremely selective as to where independence would be allowed and often provided a convenient rationale for neglect.

Many Middle Eastern countries attempted to improve their policies toward the nomads in the early 1960s. Part of this process was a series of meetings held through international organizations (such as the ILO) and regional organizations (such as the Arab League) to improve policies and attempt coordination between countries with nomadic populations. The conclusions of one of these conferences (the ILO meeting on Nomadism and Sedentarization) are briefly reviewed here. These conclusions are indicative of the kind of new policies which emerged at that time:

- a) Sedentarization is not the only way to solve the problems of raising the living standards of nomadic and semi-nomadic groups.
- b) The general solution toward these problems, however, has been encouragement of settling and changing to agriculture in a direct manner.
- c) A flexible approach between sedentarization and other methods should be taken on the road toward bettering social and economic life for these groups.



- d) Sedentarization schemes will not succeed unless they create viable communities with a full range of rural skills, crafts, and services such as to provide the population with the widest opportunity for attaining a secure livelihood.
- e) Training will play a vital role in any sedentarization scheme.
- f) Basic social services must be provided to nomads whether they are sedentary or not.
- g) Nomadic and semi-nomadic tribes are always difficult to control. Traditional chiefs must be brought under close administrative control and checks must be made on their power. Customary law and native courts must be abolished and movements across frontiers be closely scrutinized through increased international cooperation.

The significant result of these meetings was that a policy toward nomadic peoples began to be further modified, especially in Syria. Although the Bedouin often maintained his freedom to carry arms on the steppe and other "legal privileges," the inability of traditional authority to maintain order in light of the effects of earlier policies meant that the Syrian Government had to take a more active role. One means of doing this was the Badia Authority, which

is kept informed of what goes on in the Badia by means of well equipped guard stations with modern means for rapid communication. These guard stations are set up both to control the nomads and their movements and to assist them through medical and other services (UNESCO 1970:108).

The Badia Authority began to go through a transition from a security arm (as part of the Ministry of the Interior) to a development unit (as part of the Bureau of Animal Wealth in the Ministry of Agriculture and Agrarian Reform).

Although many of the Arab governments favored the policy of sedentarization and agriculturalization of the nomadic and semi-nomadic groups, it began to be argued that:

in terms of land use, nomadism is a system of maximizing opportunities for the support of human societies. In the absence of feasible alternatives to utilize the resources of the vast arid spaces in the countries concerned, nomadic grazing does provide employment, income and vitally needed food. A more fruitful and realistic policy than sedentarization would be therefore to improve methods of animal husbandry among the Bedouins so as to improve the quality

of the herds and to reduce their extreme dependence on rainfall by digging artesian wells in selected grazing areas (UNESCO 1970:110).

The advantages of maintaining the Bedouins in husbandry-related activities were counterbalanced by two arguments. First, whatever the cause, the range was and is deteriorating because of overgrazing and lack of management. Second, it is more difficult to deliver social services to a mobile population than a sedentary population. However, since agricultural sedentarization would negatively affect Syria's food output (livestock accounting for 27% of the total, about 75% of that being in the form of sheep) and since sedentarization might disrupt traditional society enough for the settled nomads to add to the mass-migration to the cities, a compromise policy came to be established.

The government would take over enforcement of range management because of the breakdown in traditional tribal authority brought about by nationalization of the rangeland. Sedentarization would be encouraged. Semi-sedentarization based on a husbandry economy would be supported and programs undertaken to increase the security of the nomads in times of drought. A system would then be devised whereby social services in health and education could be delivered to these semi-sedentary populations. Present programs are attempts, then, to experiment with alternative means of carrying out this policy.

##### 5. The Present Policy of the Syrian Government toward Nomadic and Semi-Nomadic Peoples

No country has ever devised a completely satisfactory and equitable policy for establishing mutualism between nomadic and sedentary-based populations. The evolution toward such a policy in the SAR must therefore be seen as continuous experiments at doing so. The present direction of policy has been strongly affected by past mistakes and by what appears to be a genuine interest on the part of concerned authorities to attempt to find such a solution, although the U.N. Economic Commission for West Asia (quoted through Lamb) states that:

Only Saudi Arabia has any clear settlement policy. In most West Asian countries, the nomads are victims of well-meaning but piecemeal and random policies (Lamb 1979:K3).

In trying to establish some sort of clear policy, the Syrian Government appears to be taking a somewhat sober and prudent long-range view. Since no immediate solution is at hand, a series of small-scale social experiments are being undertaken to determine what mix of intervention, sedentarization, and training would best solve the problems of the nomads, the steppe, and their neighbors.

Many of these experiments have been reported on by Boykin and Khoury (1979) from the biological and food production point of view. Their study

looks primarily at technical solutions to technical problems. This report deals with the social solutions to social problems, and attempts to assess the success of these experiments in replacing the traditional social controls as a means of providing security and delivering social services to the people. Although the traditional society is in many senses a thing of the past and therefore no longer represents an option for the nomadic people, the problems which that society attempted to solve, both through technical solutions\* and through nontechnical solutions, remain. It is therefore fair to compare the old and the new, even if the comparison is only implied.

The fact that the Government of the SAR has not established a specific policy toward the economic reorganization of the nomadic and semi-nomadic groups implies that the door is still open to make effective changes in the ways these groups interact. At the same time, this does not mean that there is no policy toward the nomads. The Syrians have made significant choices in policies and attitudes toward the social and legal positions of the nomadic peoples. The following elements of a policy can be discerned.

Officially, the policy of separatism is dead. All nomadic and semi-nomadic peoples presently living in Syria are looked upon as full citizens. As citizens, they are entitled to all services due any other citizen in the country, including health and education. These services are the same as the services to be delivered to any other group. This means that there are no special units to deliver health or education to nomadic groups. It is the responsibility of the regular ministries to see that these services are properly delivered to the nomads, as they would be responsible for that delivery to any other group in the country. At the same time, the nomads officially no longer have a special status under the law.

On the other hand, it is recognized that the nomads and semi-nomads do have special problems and as such do require some special services. According to policy, however, the type of service delivery in no way differs from the special services delivered to, let's say, horticulturalists or poultry farms by other units of the Ministry of Agriculture and Agrarian Reform (MAAR). For this reason, the Bureau of Animal Health was broken up into the Directorates of Veterinary Services, Animal Husbandry, and the Badia. It is only this last Directorate of the MAAR which deals specifically with the problems of the steppe. The services of this office are seen as part of the routine services due any citizen undertaking a specialized way of life.

In order to enlist the support of the traditional tribal leaders, the Government, the Ba'athist Party, and the Peasant's Office have

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\*Hardin defines a technical solution "as one that requires a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality" (Hardin 1968:31).



maintained an open door policy toward the Bedouins. The leaders of these groups are encouraged to come to any of them at any level and discuss their problems. For this reason too, the problems of the Bedouins have been given some priority within the government. It is important that the transition between tribal independence and identification with national values be made quickly and smoothly to see that this is done.

Finally, although agricultural sedentarization is no longer considered a catch-all solution, policy still dictates fairly strong limitations on the movements of the Bedouin. For the bulk of the concerned population, this does not present a problem. Map 1 shows that semi-nomadic peoples which account for a large portion of the mobile population in Syria, already move in fairly limited transhumant cycles around a given home center. This type of system is being encouraged for other groups who do not wish to abandon their life in the steppe.

The policy is encouraged for four reasons. First, it facilitates the delivery of social services in health, education and in other areas. Old people, women and children are the major users of this type of facility. If these remain in a village through most of the year, facilities can be built for them in the village and there is little or no need for mobile facilities. Second, settlement around a center allows the building of infrastructure such as wells, fodder storage units and so on. These could not be built if there was no semi-permanent center for the Bedouin. Third, centralization increases the ability of the government to form a stable interface with these people through the programs of the Peasant's Union. It also enables the government to keep a better account of production and thereby helps them plan more effectively for future needs. Finally, the security of these villagers will increase, not only because of better health and education facilities, as well as provision for emergency fodder shortages and drought, but also it makes possible the enforcement and education necessary to get people to identify with specific areas of land and understand their responsibilities in properly managing it. This improves the security of future generations.

Each of these approaches--ending duality under law, national identification and sedentarization--increases the security and stability of the life of the nomads while offering them a greater stake in the future of the country as a whole. The policies offer more options to the mobile peoples and eliminate the hypocrisy of separatism which was more a case of neglect. The government is now taking responsibility for trying to work out a plan to improve the quality of life on the steppe. As no comprehensive plan presently exists, some innovative social experiments are under way to find one. The review of these experiments is undertaken in the sections which follow.

## 6. Programs for Mobile Populations in the Syrian Arab Republic

The backbone of the program to deliver social services to semi-nomadic peoples in the Syrian Arab Republic is the Range and Sheep Improvement (or alternatively the Sheep Production) Cooperative Program. According to figures from the World Food Program (Project 2018 1979),



there are now a total of 46 such cooperatives with combined membership of 11,194 (note: this means households, not individuals), protecting 6,208,850 ha. of land and involving 983,011 head of sheep.

The purpose of these cooperatives is to improve the security of the semi-nomads through the purchase of supplementary feed for sheep of members, the provision of a fixed area for grazing the flocks of members and the improvement of the quality of that grazing area through conservation measures such as the replanting of shrubs and grasses. In addition, there are plans to involve the cooperatives in marketing, and there is a growth in capital expenditures for cooperatives such as feed warehouses, well improvements, trucks and so on. There is also an indication that these range cooperatives might become the core for a means of delivering social services to the population on the steppe, in education, literacy training, health and in other areas.

For most of the residents of the steppe\*, the cooperatives represent the point of articulation between government programs to increase the security of the semi-nomadic groups and those groups themselves (see Appendix II and III for descriptions of these programs). The Sheep and Range Cooperatives are part of an extensive policy which represents a "middle path" between the older policies of non-intervention and those of sedentarization discussed above.

The Syrian Government appears to have abandoned the policy of the nationalization of tribal land. Instead they have returned to the policy of assigning certain territories to certain groups for their exclusive use in return for their maintaining it. The government has attempted to replace the traditional leadership of the tribe in the cooperative with an elected board of nine. The land which has been assigned to these cooperatives coincides, not accidentally, with the territory once occupied by the local tribes in the period before nationalization. Although it is the policy of the Syrian Government to eliminate the tribal basis of that territory (so that land occupied by a cooperative could be open to any potential member from any tribe as long as his interest was raising sheep), for the time being this has not been accomplished. Furthermore, although cooperative heads are elected, they remain essentially the same individuals who occupied leadership positions in the tribe. The cooperative, for all intents and purposes, functions essentially the same as a tribe, under a new name.

The legitimization of specific territories, however, strengthens the pattern of small regular movements around a given center (cf. Map 1) during the yearly transhumant cycle. By further limiting these territories, providing feedlots for meat production and supplementary feed

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\*These range coops involve only Bedouin groups, as the Kurds and Turkomans all live in mixed agricultural and husbandry areas north of the Badia proper. Those who belong to coops, belong to regular agricultural coops.

for animals on the range, the circumference of these yearly movements can be further curtailed. This means that the operating radius of any semi-nomadic group might become small enough to warrant the setting up of central social services delivery, and police protection. These centrally located units would then be in the reach of most members of the cooperative throughout most of the year.

At the same time, by making usufructuary rights to land available only to the cooperative members, range improvement becomes economically feasible as well as technologically possible. At present, only 2,880 ha. have been planted with Atriplex sp. shrubs. This is an expensive and tedious process. Although the nurseries are now full of seedlings, no groups would be willing to undertake such a program if they thought other groups could undo the work quickly through illegal grazing. Assigning land is only the first step, however; endorsing and protecting that assignment is a second and more important step. There is support for range management techniques among the Bedouin in certain limited areas, but as we shall see that support is tenuous and needs careful development.

All sheep on cooperatives are privately owned, and control of flock size represents another major difficulty for the Syrian program. Unless the sheep population is controlled, it is unlikely that any range management technique will be successful, for any victory will be quickly eaten up.

Many of the programs are in pilot form. In spite of the impressive numbers for cooperative membership, the major successes have centered around the delivery of feed. The conservation, marketing and social services roles of the cooperatives are as yet only in a nascent form. Although the feed program in certain areas has been effective, in other areas the results and even program activities are less clear. The following sections of the report deal with the major program efforts presently under way.

## 7. The Sheep Cooperatives

### 7.1 The Origins and Policies of Sheep Cooperatives

The first sheep cooperative was located in Essyrieh, about 150 km. northeast of Aleppo. The cooperative, originally called Abu Fayad, was organized in 1968 and had only 40 members. Today it is the largest sheep cooperative in Syria.

The initial purpose of the sheep cooperative was the distribution of supplementary feed for the sheep of the Bedouin. In the initial phase, it was necessary to first convince the Bedouin of the efficacy and safety of these feeds. It was believed, according to some sources, that supplemental feeding would bring death to the ewes. One man reported that during periods of drought, the death rate from starvation was so high (nearly 50%), that it was possible to buy a ewe for the price of a cigarette. Once the Bedouin realized that the feed did not add to this high death rate, in fact had the opposite effect, the first victory of the coops was won.



In order to bring more Bedouin into the cooperative system, the government gave out free feed in the first two years of the establishment of their programs. There was a limit, however, of sixty ewes which could be fed under the program. In return for increased security, the government wanted to decrease the size of the flocks using the range. This created a second major problem. Each Bedouin was asked to register his best sixty ewes as he joined the cooperative for supplemental feeding under the program. Feed was available for the rest of his flock, but only on the private market.

A rumor got started that the sheep that were being registered were going to be confiscated by the government under the cooperative program. This stiffened the resistance of the Bedouin. The feared nationalization of their flocks did not occur however, and as the value of the supplemental feeds became better known along with the special financing for feed purchases, membership in the cooperatives began to grow.

The real growth in membership did not take place however until the problems of leadership were finally solved. Bedouins complained that the early leaders of the coops were "not cooperative men." Apparently the early leadership of the cooperatives was made up largely of politicians selected by the Peasant Union. It is not known whether or not these leaders were Bedouins, but it is certain that they did not have the full cooperation of the Bedouins themselves. In that initial phase, the cooperatives only grew from 40 original members to about 70 members in 1971 in spite of the programs which were introduced. Even those who became members were not wholehearted supporters and there was difficulty in getting members to pay back loans. In short, there was resistance to the new ways. It was during this period that the rumors about confiscation of sheep began as well.

In short, this type of behavior is the same kind of resistance one used to find against the government-appointed tribal leaders in the earlier Bedouin policies.

The solution was quite simple. The appointed leader of the cooperative was removed and replaced with an elected leader, often the traditional sheikh of the tribe. Almost as soon as this was done, the membership of Abu Fayad cooperative grew to 1000 and soon to 1500 in 1976. It was a lesson well learned and it is likely that many of the coops will be led by traditional tribal leaders for some time in the future.

The cooperative program grew with the addition of the Bilas and Abu Rejmain cooperatives near Tudmor. By 1973, cooperatives were being formed in Aleppo and Al-Rakka Mohafazat. Cooperatives were not formed in Deir-ez-zor, Al-Hasakeh, Damascus or Dar'a until as recently as three years ago and neither non-Bedouin, semi-nomads nor full nomads (living

in the southeast portions of Syria, called al-Hamad) are affected by the programs to this day.\*

The entire cooperative program was initially supported by the UN/FAO World Food Program (Project 002) which helped establish grazing control over 400,000 ha. in the Essyrieh cooperative area and claimed to be providing feed for 55,000 sheep by 1970. A revolving fund (now called the National Feed Revolving Fund or NFRF-A) of Syrian £2.9 million was begun to help the cooperatives finance the cost of the feed. The entire cost of the program between 1967 and 1972 was \$1.14 million and an additional \$4.8 million was spent between 1974 and 1979 under World Food Program (WFP) Project 2010 (cf. Qalyoubi 1977).

Throughout the history of the sheep cooperatives, the Syrian Government has been using the supplementary feed program as a means of attracting membership to the cooperative movement. The government has been trying to find a formula which would continue to attract members while putting a ceiling on flock size. This goal has proved elusive.

Initially, the government fed 60 ewes for free. In later years, however, the free fodder distribution program was dropped and financing under another WFP was begun. The government attempted to curtail the size of the herds by allowing credit on feed for only 300 head. This figure was reduced to 200 head, and in recent years financing could be obtained for a maximum of only 100 head. This means that all fodder purchased over that quantity deemed optimal (under government-set norms) would have to be purchased for cash on the private market.

During 1979 government policy again shifted. It was decided that all breeders should become members of cooperatives in order to speed up the process of territorialization. In order to encourage this, all feed sales became the monopoly of the cooperatives. A herder must therefore be a member of the coop to get feed. On the other hand, there is no ceiling on the availability of feed, although the financing rule (100 head maximum) in all likelihood is still in force. The result of this ruling has been a rapid rise in the "on paper" formation of cooperatives and a growth in the size of cooperatives already on the books. The number of cooperatives in Deir-ez-zor, for example, has risen in one year from one to seven. The new program, therefore, appears to be a successful recruiting tool for the cooperative movement, but the lack of ceilings on sheep ownership continues to be a disturbing element in the program.

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\*The former, because they live in mixed agricultural and husbandry areas, thus making them part of the regular agricultural coops; the latter, because contact with them is infrequent and it is felt that the extra range given them by their camels makes supplementary feed programs unnecessary and thus the cooperatives of little value to them. In addition, the multinational living area of the full nomads' migrations makes any national program ineffective through much of each year, when a change of seasons takes these people out of the reach of it by crossing national boundaries.



## 7.2 A Measure of the Success of the Supplemental Feed Program

It is hard to demonstrate the success or failure of any program and the sheep-feeding program is no exception. The sheep market is a complex and paradoxical one, which produces high prices for meat when the pasture is good, and low prices for meat when there is drought. The market seldom reflects the current state of the steppe and often reflects conditions no longer present. For these reasons the market is not a good indicator of the effectiveness of these feeding programs without complex analysis.

Another simpler indicator exists, however, which involves a change in the economic behavior of the Bedouin themselves and demonstrates that the feeding programs have been effective on the steppe.

Earlier we described the traditional relationship between the urban merchants and the Bedouin. We showed that a complex partnership exists where the merchant purchased the sheep which the Bedouin took out on the steppe. The profits from the sheep went to the merchant until one-half of the original purchase price was realized, then the Bedouin and the merchant became equal partners.

It may be puzzling why this relationship often continued over many generations. Why, one might ask, did the Bedouin not take their profits and buy their own sheep to free themselves from the merchants? The answer is not mainly the lack of capital, as one might expect; rather, the unwillingness of the Bedouins to take financial risks has been substantial.

In bad years, up to 50% of the flock may be lost. The difference between a good year and a bad year is due mainly to rainfall, which is always unpredictable. The risk factor is, therefore, predominant. Since the merchant is willing to assume all the risk in the transaction, the Bedouin is willing to oblige him, and primarily for this reason the partnership has lasted.

Today the traditional partnerships between the merchants and the Bedouin are rapidly disappearing and the Bedouin are more frequently full owners of entire flocks. Many Bedouin appear to always have had capital. Major purchases of pickup trucks, tractors, and water tanks, begun in the early 1950s, are increasingly made and require large amounts of ready funds. The Bedouin, however, have continued to remain shy of stock purchases.

Recently, however, Bedouin have begun to purchase stock as well as machinery. No new source of financing has been made available and the loans of the Agricultural Cooperative Bank for purchasing livestock are known to be much too small to help stock owners (an allowance of only Syrian £30 per head is the maximum). Moreover, the partnerships began rapidly to disappear and all sources agree that stock purchases by the Bedouin themselves continued on the rise.

What appears to have happened is that the risk of keeping sheep is lower today than several years ago, and the Bedouin are now increasingly

willing to take the risk of investing in sheep for the larger share of the profits. The only change in the recent situation on the steppe which could possibly affect this risk is the addition of the feed program. In the eyes of the Bedouin, therefore, the supplemental feed program is effectively increasing their security. This is reflected in the change in investment patterns which should lead to increased wealth for the Bedouin in the near future, since they are less frequently sharing the profits for their ventures with members of the merchant groups.

### 7.3 The Territorialization of the Cooperatives and the Conservation of the Steppe

Since the major function of the cooperative is to improve the overall security of the Bedouin, the role of the cooperative must include the function of range protection and range improvement. Part of the role of the supplementary feeding program is to support this function by providing relief from overgrazing to certain areas of the steppe through the provision of alternative forms of feed for sheep.

This program, unfortunately, is an expensive way of solving the problem. Moreover, a second problem appears as a result of this program. As any program improves the range or increases the capacity of the system to handle sheep, so will the number of sheep soon increase to meet that increased capacity. A means then has to be developed to control the use of the range and limit the growth of the size of the flocks utilizing it. To do this, a means has to be devised for individual or group control over the use of a territory.

Traditionally, as we have noted, this type of control was exerted by individual tribes which treated large areas of the range as common property and defended those boundaries against intrusion. Sections of that range were maintained under traditional principles of range management under the "Hema" system (cf. Draz 1956, 1977). The tribes' authority over the steppe was destroyed, it will be recalled, through the nationalization of land, which eliminated the legitimacy of their authority over any part of the steppe. The steppe reverted to commons and this in turn led to a tremendous decline in environmental quality due to overgrazing and other forms of irresponsible usage.

Cooperatives are presently being established in many parts of the steppe. It is part of the Syrian policy to reestablish some sort of localized control over every part of the steppe by giving one cooperative authority over each area. The cooperative is therefore being placed in the position once held by the tribe.\*

According to Law 13 of 1973, the cooperative members have exclusive use of the land on which their cooperative has been established, and the

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\*Since many of the cooperative leaders are the old tribal leaders and since cooperative boundaries are often the same as old tribal boundaries, this is not a difficult leap to make.

law backs up the right of these cooperatives to maintain the security of their boundaries from the intrusion of nonmembers.

Of course, no cooperative is in a position to constantly patrol these boundaries, but since the best grazing points are always limited to a small part of the steppe during each period of the year, any intrusion from the outside is generally obvious. Disputes can be handled peacefully, with arbitrators first from the coop itself, then from the Peasant Union, and finally, if it becomes necessary, with help from the police. Law 13 specifies the conditions under which an intruder can be jailed.\* Although there are still problems in maintaining the integrity of their claims, the situation is improving for the coops. The attempt to bring the entire steppe under the cooperative system may further improve the situation.

Once that integrity has been established, steps can be taken to improve the condition of the range in individual cooperatives. The exclusive use of that range makes such conservation not only economically feasible, but psychologically possible as well.

The Sheep and Range Station at Wadi al Azib was established in the midst of eight such cooperatives. It provides, or will provide, continuous demonstration of the effects of controlled grazing, sheep-breed improvements, veterinary techniques, shrub transplantation, and water-management techniques. It also provides technical advisors to the cooperatives which would copy these techniques. Shrub plants (seedlings and cuttings) are available from a nursery or from Aleppo and Damascus. A new nursery is being planned at Otami.

Each of the possible programs is at a different phase of development. A brief description (derived from site visits) of the present condition of the conservation programs is as follows:

A) Shrub Plantings:

- 1) A nursery program at Aleppo exists, growing shrubs from cuttings. There are problems in transporting the cuttings live for transplanting.
- 2) Land has been set aside for a nursery at Otami. There is no program at present.

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\*Everybody wants to avoid the bloodshed which characterized inter-tribal relations in the past. In Essyrieh during the French rule, for example, there were several wells. Each well belonged to a different tribe which used the area. If each tribe kept to its own well, there would have been plenty of water; but each encroached on the other's water. Battles frequently broke out and the French, ruling at the time, had to take over and supervise the area. At one well, there is still a giant stone "X" along the ground which marks it as government land.



- 3) One-, two-, and three-year-old plantings at Wadi al-Azib, Essyrieh coop, al Mawaleh and at al Kirim station. All looked successful, but all still needed protection from grazing. A nursery for Atriplex seedlings has been started.

B) Demonstration of Controlled Grazing Techniques:

- 1) These are limited to Wadi al-Azib station, where fines for grazing, except for station sheep, are fairly stiff. Since there is no ceiling on flock size elsewhere, the techniques are hard to transfer.

C) Earth Dams and Water Spreading:

- 1) There are two surface dams on Wadi al-Azib (called Al Sib and Al Mohrab); there is another surface dam about 60 km. south at al Fasdy. Another dam at Abou Fayab is as yet not finished.
- 2) Comments on the dams are that they are too large, and store too much water in one place, opening it to too much water loss by evaporation and silt formation. Now favored is the replacement for this type of dam with smaller catch dams which spread the water and induce storage in the soil. By experimenting with these dams on a small scale, a proper technique could be selected for the coops with minimum capital expenditure.

D) Cleaning of Wells and Roman Cisterns:

- 1) This program is accelerating. Individual Bedouin are paid a flat fee for each well or cistern they clean.

E) Enforcement of Ploughing Regulations:

- 1) This is an important part of the range improvement program, but it is hard to enforce. The stricture against ploughing is strictly enforced in Wadi al-Azib and around the "town" of Essyrieh. Elsewhere, ploughing is common in any area low enough to hold water.

8. The Limitation of Movement and the Delivery of Services

Although the yearly transhumant movement of semi-nomads has always been narrowly circumscribed by ecological factors, the introduction of the delivery of social services might further serve to narrow their movements each year. At the same time, the restriction of migration could make the delivery of those services easier and less costly. Although social service delivery in the villages which surround the steppe is quite comparable to that of other villages in rural Syria, delivery of services to people on the steppe is virtually nonexistent. If a Bedouin semi-nomad, for example, wants his children to go to school, he must camp near a village where a school exists. To do so is difficult during the



school year, for he must also keep his flocks away from the farmers' crops and yet manage to feed his flocks while staying close enough to the village for his child to go to school. This is virtually impossible and therefore accounts for the high degree of illiteracy reported among the Bedouin.

There is only one school, at present, which serves the semi-nomads on the steppe. This is the Essyrieh Training Center. The Center was begun with funds from the WFP Project 002, but although the school was started in 1969 as an adult literacy program, agricultural skills center, and a primary school, it was closed through lack of funding in 1972. Only the primary school program was revived in 1978, although the literacy program is scheduled to be revived in the fall of 1979.

The school currently has 38 students, with 42 having begun the school year. The teacher is of Bedouin descent, although he comes from an outside area. The origins and commitment of teachers for such schools are important as demonstrated by an attempt to start another school at Wadi al-Azib. This attempt failed when the teacher, a man from Lattakia, quit because he was not able to make the adjustment to life in the Badia. Another attempt will be made to establish the school in 1979-80, if a teacher can be found.

The experience at Essyrieh is important for it serves to teach basic lessons in establishing social services in the steppe. The example above demonstrates an important first lesson: that a special type of person is needed to work on the steppe. Commitment to the people and an understanding of local customs are essential but not easily found.

A second lesson, learned from Essyrieh, is that yearly schedules, such as the school term, have to be adjusted to meet the special needs of the people living on the steppe. Currently the school year runs from September 15 to May 15. During that period 25 Bedouin families camp within a 7-km. radius of Essyrieh in order for their children to attend school. Children either walk to school or occasionally are brought there by one of the family pickup trucks or by a car belonging to the Syrian Government.

This arrangement is inconvenient, for aside from the obvious problems of getting the children to and from school, there is the problem of a school schedule which does not coincide with the Bedouin's transhumance schedule. Bedouin generally return to the steppe in October each year, after all, the forage and stubble has been exhausted in the agricultural areas. They like to stay in the steppe until June. That they return early to the steppe in order that their children might go to school is an indication that the Bedouin are favorably disposed toward educating their children. A modification in the school year to more closely coincide with the Bedouin transhumant cycle seems a logical step in future programs.

Many of the villages on the edge of the steppe are the product of the sedentarization process which has been taking place among the Bedouin

for the last 80 years (cf. Bakour 1976; Chatty 1979; Sweet 1960; and Hinnebusch 1976). The establishment of any government office on a piece of land with access to wells or even to good quality cisterns generally signals ploughing and the beginning of the sedentarization process, even in the fairly deep steppe. This clustering process has often resulted in the formation of fairly large villages.

Such a pattern has had to be discouraged in the case of Essyrieh. The rule against ploughing has been strictly enforced and so settlement, with the exception of a few small stores, has not taken place. The area has therefore become a service settlement, supplying feed storage warehouses, wells for tank trucks, a police station, a few stores, the Training Center, and a potential location for other services as well, in the center of land controlled by a single cooperative. It also provides a potential laboratory for developing a system for social service deployment on other cooperatives in the future.

The major weakness of this center is the lack of medical and veterinary care. In the Essyrieh area, the need for a doctor or a veterinary technician (secondary school graduate) requires travel to Hama. One Bedouin I interviewed indicated that getting such services was not difficult if one had access to a car; otherwise, the problem was acute. If a veterinarian were needed, for example, someone would have to go to Hama to find him, then rent a car to bring him back to the steppe, and finally return him to Hama. Although the veterinary service is free, the entire process would cost about Syrian £200 and would take a couple of days.

For those living on Wadi al-Azib, service is a little better. All residents are government employees (20 permanent employees including 16 shepherds, 1 agricultural technician and 1 veterinary technician who are apparently not available to breeders in surrounding cooperatives, and 2 agronomists). In addition, there are many temporary laborers, such as the children of local shepherds who work in the Atriplex nursery. If one of these persons becomes ill, they are brought to Hama at government expense for treatment.

By creating service centers on cooperatives, a pattern might be formed which would allow improved social security for Bedouin on the steppe, improvement of his social condition, and at the same time would permit semi-nomadism to continue as a viable strategy for making a living. Only the Essyrieh cooperative has developed this concept far enough so that these services are present in any form, and thus their progress should be carefully followed. Additional services need to be quickly added here and a prototype or laboratory for later social programs begun here to be spread throughout the cooperative system, along with the programs of land management and improved production.

Other cooperatives already have areas mapped out where these facilities could be effectively located. Of the ten cooperatives in Hama (see Table 2), two have one feed warehouse and three have two feed warehouses each. These warehouses are conveniently located within the coop in an area where social service centers could be developed as well. Each

Table 2  
Cooperatives for Sheep Breeding in Hama, 1979

Cooperative	Warehouses Built	Warehouses Planned (1980)
Essyrieh	1	yes
Ba'ari	0	yes
Al Fa'an	0	no
Al Bilas	2	yes
As Saen	2	no
Akarbat	1	no
Sha'ar	0	no
Al Hamra	2	no
Azoba	<u>0</u>	no
Total	8	

Source: Peasant Union--Hama.



cooperative is supposed to have a veterinary technician and either an agricultural engineer or a technician. Such technicians have not yet been permanently located for the coops.

Perhaps the solution lies in simplified, practical sources in range management and sheep care for local inhabitants. One must not underestimate the animal management skills the Bedouin already possess. Additional specialized training for selected members of cooperatives may solve many of the personnel problems until others can be given more complete training to become qualified vets, range managers, and health workers.

There is less of a personnel problem in cooperatives located in areas contiguous with larger towns. In Salamieh, for example, there are two sheep coops and several agricultural coops, as well as an experimental station (Al Kirim) which is working with the problem of improving the wool, meat, and milk characteristics of the local breed of Awasi sheep, as well as experimenting with several combinations of ground cover. Both programs involve the cooperation of the Syrian Government and ACSAD (which is donating, among other things, computer time for maintaining the breeding records of sheep). It is easier to recruit personnel for this type of area. The two sheep coops share a full-time graduate agricultural engineer. Unfortunately, this is an example of the "bunching up" of personnel, concentrating talent in one limited geographic area while other locations go begging. The reasons for the problem are understandable, but a solution to the problem must be found and the distribution of personnel improved.

The history of the development of the cooperatives presented above describes in large part the pattern of their development. The program is a careful one, which is being developed slowly. Even increased investment should not greatly accelerate this pace. Items in the program which have proved their worth, such as Atriplex plantation and feed warehouses, are passed on for use in other cooperatives as they develop. Things which do not work, such as the large-scale surface dams, are discarded for new methods instead of being passed on. Uncertain programs or programs that need great experimentation such as the development of new types of Awasi sheep are carefully done. The sheep, for example, have been developed specifically with the local ecology in mind and have been tested for disease resistance at Al Kirim. This year they will be passed on to other government stations in different climatic areas for testing before they are even considered to be passed on to the breeders.

For the cooperatives and other programs, one must therefore assume that capital development and organizational support are concentrated in the oldest cooperatives centered in the Homs-Hama and Aleppo regions. Other cooperatives, although present, are in the earliest phases of their own development and today represent little more than a means of purchasing and distributing feed during part of each year. The staff of the Badia Directorate is still quite small and centered in Damascus. Control over their own programs, even contact with these programs, is hard



to maintain.\* A glance at Map 2 indicates the general placement of programs related to the Bedouin. It also indicates the general direction of movement for the future with present programs starting at the roads and in the areas of highest population density and working inward on the steppe. Presently, except for the sudden spurt of coop formation due to the linkage of supplemental feed with coop membership and the related territorialization of the range, little more has been accomplished on most of the remaining central steppe. One must look to the direction of what these programs already accomplished on older coops to see the direction of what is planned for the rest.

## 9. Communication and the Problems of the Steppe

Elsewhere I have commented on agricultural extension programs in Syria (Manzardo 1979) and criticized the lack of communication between government agents and the farmers themselves. In fact, I went so far as to state that there was little chance for increasing the degree of communication in many of the programs as they exist. This is not a problem in the programs of the Badia Directorate. The degree to which communication is taking place between Bedouin and the government is what gives this program its greatest hope of success.

This communication is not accidental. It is due to several important factors all operating at the same time. First, as we have pointed out, much attention has been paid to see that the programs are consonant with the traditional patterns of life of the Bedouin. The programs not only do not violate the principles important to the Bedouin, but also follow an approach to problems which appears reasonable to them. Those in charge have paid attention to lessons learned in the past. Second, there appears to be a bond of mutual respect between the Bedouin and those working in the steppe. Finally, the programs reflect a recognition of common interest in saving the rapidly deteriorating conditions on the steppe.

One of the main indicators that this communication has been taking place is the high recognition factor for government officials. Even high-level government officials concerned with the steppe are known to the people of the Badia. These individuals often travel to the steppe bringing students<sup>†</sup> and other outsiders to visit, so that they might learn about the steppe.

Conflicts between the Bedouin and the officials do develop, as might be expected, and sometimes the enforcement of laws is painful. For

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\*My tour guide, for example, was greatly embarrassed when the Otami Nursery, already scheduled to be under operation, was found to be deserted when we arrived.

<sup>†</sup>The Essyrieh Training Center is used as a dormitory for University of Damascus students each year for a field trip in a range-management course.

example, encroachment on the Wadi al-Azib range was once a major problem. Repeated and gradually increasing fines seemed to have had no effect, so the manager had a member of each of the nearby tribes arrested and put into jail for four months. My tour came when each of these men had served two months of their sentences. One night, we had dinner with the brother of one of those who had been jailed. Nearly the entire conversation centered around this older brother's attempt to free his kinsman. I was told that the arrest of one member of the tribe brings shame on all the other members, thus all felt responsible for the crime. The discussion centered on why the man was jailed and why it was bad to encroach on the protected land. The conversation went on to range management and it was apparent that this was not the first time such a conversation had taken place in the last two months. Although the Arab code of hospitality requires that any guest be treated hospitably, even when they are not liked, it was apparent that the official responsible for the arrests was both liked and respected. It was also apparent that the government's position was being understood and, to a degree, accepted.

Part of the reason for the good standing of the government workers is their dedication and their reputation for honesty. The potential for dishonesty is high since there is little supervision on the Badia. The increasingly protected resources verifies the field personnel's reputation for honesty and dedication.

As already mentioned, the division of the steppe into territories apparently the same as those once controlled by the tribes and their placement under the control of cooperative boards similar to the traditional tribal councils are ways in which the new programs are consonant with the traditional way of life. Another example is in the day-to-day operation of the loan program for the purchase of feed. For some Bedouin, Moslem orthodoxy forbids their participation in any transaction involving interest payments. For this reason, certain funds have been set aside within the revolving fund to allow borrowing without interest. This permits certain villages to participate in the feed program which would otherwise have to be left out. This approach puts change into a form which can be handled and thus new types of interaction flow in channels which have already been established.

#### 10. Bedouin and the Other Sectors of Syrian Life

All of the programs listed above have been fitted into the context of the range itself. As important as these programs are, however, concern for the increased security of the Bedouin also has to include increased secure relations with other segments of Syrian life as well.

Chatty (1978) and others have divided Syrian society into three major sectors: the steppe, the village, and the city. We have noted that the Bedouin have never been totally independent from either of the other two major divisions of Syrian society. We have discussed the traditional relationships between the Bedouin and farmers and noted how the state traditionally intervened on the side of the farmers to protect its major

source of food. We have also discussed the traditional partnership between the Bedouin and the urban merchants and have shown that partnership has declined in recent years.

Although the increased security of the Bedouin has led to an increase in their own risk-taking behavior and thus has led to a decline in merchant-financed Bedouin herds, the merchants continue to play an important role in the husbandry economy of the nation and therefore in the condition of the steppe. The Sheep Fattening Cooperatives play an increasing part of this role.

Sheep Fattening Cooperatives are only cooperatives in the sense that members purchase their feed supplies together and can occasionally market sheep together. Otherwise, each fattening yard is essentially a private venture. Some of these yards (in Aleppo) have been functioning since 1967 (Boykin and Khoury 1979). The coops purchase male lambs from the sheep breeders on the open market. Their efforts are supported by credit from the WFP. According to Boykin and Khoury, 3.5 million sheep are fattened each year in these lots (2.5 million of which are local Awassi sheep). Sheep are sold either to the sheep marketing board or to private contractors. (Details of the system can be found in Boykin and Khoury 1979:68-72, and will not be repeated here.)

This system allows sheep breeding, fattening, and selling to remain an essentially speculative venture. Today, however, the role of the merchant has been shifted from that of a partner on the range to a feedlot owner and customer for lambs. Although the government has been discussing a new system for the sale of lambs to fattening coops, no such system has yet emerged.

Traditional relationships between Bedouin and farm villages have continued in the sale of grain stubble in the field, sold in the months of June to October. The present high cost of stubble (Syrian £150 per hectare in 1979, up from Syrian £75 per hectare in 1973) as well as the high cost of "short" barley\* is likely to cause a tremendous upsurge in the amount of illegal ploughing on the steppe. A Bedouin who has planted barley on a piece of waste rangeland is likely to buy himself one to two extra months of the steppe, and if he is lucky, or plants on a sufficient amount of land, he may not have to leave the steppe at all each year. This means that he does not have to pay the high prices for grazing in the agricultural areas. The farmer who plants barley in a marginal field earns a little extra money each year with very little work (for the crop does not have to be harvested).

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\*"Short" barley is barley which is grown in moist areas of the steppe where there is too little rainfall to produce a harvestable crop, but produces one which is salable for animal fodder as it stands in the field. The current price of "short" barley ranges from Syrian £250-600 per hectare.



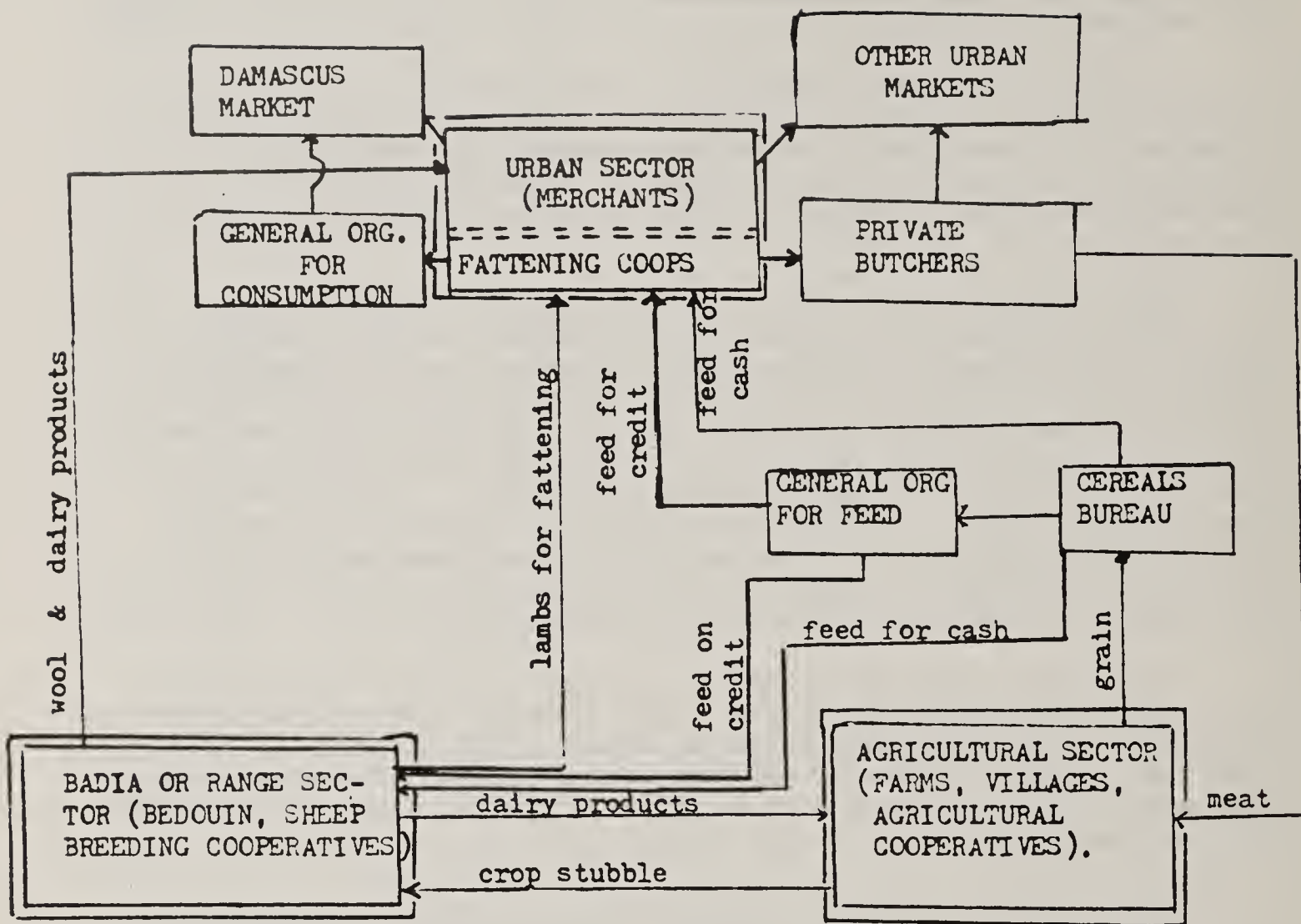


Figure 2. ECONOMIC RELATIONSHIPS BETWEEN RANGE AND OTHER SECTORS OF THE SYRIAN ECONOMY-SCHEMATIC.



and in bad years, he is saved by the Bedouin's purchase of his ruined crop. The effect on the steppe is well known to be devastating. The high cost of feed in the months of June to October encourages illegal grazing as well. In recent months convictions have been obtained for both illegal ploughing and illegal grazing.

Although feedlots are supposed to relieve some of the overgrazing stress on the steppe, there are 7.07 million sheep listed in the Statistical Abstract of 1977. Of this (according to Boykin and Khoury 1979), about 3.5 million are raised in feedlots; the rest are out on the steppe. Supplemental feeding guarantees a greater survival rate each year and this results in larger flock sizes during each succeeding year (see Table 3).

A bad situation has been made even worse by the growth in the use of pickup trucks and other motor vehicles by the Bedouin since the early 1950s. This is an interesting case of technical change. The vehicles increase both the mobility and the security of the Bedouin, as pointed out by Chatty (1976, 1978), for they permit the Bedouin to operate over a wider range and in the deeper steppe. The trucks allow the Bedouin to haul water and feed to the sheep or, conversely, to search wide areas for food and water supplies, as well as to utilize the veterinary facilities in Hama and take their children to school. The ownership of these vehicles is an indicator of the economic health of the Bedouin, for such equipment is expensive.

On the other hand, the steppe is now crisscrossed with roads created by a surprisingly heavy flow of traffic in the Badia. The damage from driving and overgrazing has also spread to the deep steppe, which could seldom be used before the introduction of the truck.

The use of motor vehicles has had another effect, which in social terms may have more impact on the Bedouin than any of the social programs mentioned above. The programs we have been discussing so far have had one goal of increasing the frequency of contact between Bedouin and other groups, while at the same time permitting the Bedouin to continue their economic pursuits under improved conditions. The pickup truck, for better or for worse, is one of the strongest ties between the Bedouin and the outside world. The Bedouin need cash for gasoline and spare parts and because of this they must participate in the society outside the steppe. There is, through the truck, a bond of common interest between the Bedouin and the rest of society which should not be overlooked.

## 11. The "Middle Path" Bedouin Policy of Syria

In the opening sections of this report, I presented a history of national policies of Syria toward the Bedouin and the reasons for the changes in policies throughout several periods of Syrian history. I pointed out in broad terms that two major types of policy have been applied. The first could be termed the "non-intervention" policy, but

Table 3

Sheep Populations in Syria by Year and Mohafaza, 1971-77  
(000)

Year and Mohafaza	Sheep Milked (steppe)	Sheep Slaughtered (steppe and yards)	Total
1971	3,088	2,368	5,456
1972	2,993	2,173	5,166
1973	2,822	2,018	4,840
1974	3,267	2,028	5,295
1975	3,815	1,994	5,809
1976	4,233	2,257	6,490
1977:			
Damascus	223	140	363
Aleppo	728	500	1,228
Homs	703	383	1,086
Hama	728	553	1,281
Lattakia	15	11	26
Deir-ez-zor	249	371	620
Idleb	247	167	414
Al-Hasakeh	574	324	898
Al-Rakka	493	278	771
Sweida	91	44	135
Dar'a	146	42	188
Tartous	18	12	30
Quneitra	<u>24</u>	<u>6</u>	<u>30</u>
Total	4,239	2,831	7,070

Source: Statistical Abstract (1978:231).

actually could better be termed the policy of "containment." In this type of policy, the Bedouin were allowed to continue living as they chose, as long as they remained within an assigned territory and as long as they did not interfere with those living outside that territory. This type of policy was shown to be limited by the fact that there is competition between those living inside and outside the circumscribed areas for a limited number of resources at points of interaction. Interaction, whether violent or not, is necessary for the survival of both groups.

The second policy, the policy of "sedentarization," is essentially an assimilationist policy. It was noted that this was the preferred policy of those Arab countries taking part in the UNESCO conferences on sedentarization in the 1960s. This policy eliminates the competition for resources by eliminating the difference in populations. The Bedouin become settled farmers and the problem is resolved. The limitation of this policy, however, is that there is not enough arable land to go around on the Syrian steppe, and so this policy is likely to contribute to the already extremely rapid urbanization of the SAR. On the other hand, much of Syria's food production comes from animal husbandry. This is too large a part of Syria's food supply to eliminate without a major attempt at saving the way of life of those who produce it.

The Syrians are now attempting essentially a third policy, that of a "middle path": this is a policy which allows the continuation of the Bedouin's way of life as animal husbandmen, allowing them to continue to regulate their own groups on their own territories in essentially their own way, while at the same time bringing them more and more into the economic and political world of the sedentary groups. The question, however, is: Can this middle path exist without turning into a policy of assimilation?

The question itself betrays several assumptions which we have been trying to combat during this discussion. The first of these assumptions is that the culture of the Bedouin is somehow inherently stable, even stagnant in the sense that it has remained inherently unchanged through many years, while change has been going on around it. This assumption, although full of romantic appeal to outsiders, is largely incorrect. The Bedouin have lived in a constant state of adjustment to, and accommodation with, the agriculturalists around them. We have noted that the Bedouin, those whom the Bedouin recognize as being in the group, live in a continuum of life styles from full nomadism to sedentary village life. The percentage of Bedouin living in one style or another depends, as we have pointed out, and has always depended, on changes in geoclimatic and political factors and that this adjustment appears to wax or wane in one direction or another as those factors change over time. Villagers living in the Jezireh were nomads 80 years ago (as Bakour 1976 points out), yet may again be nomads 80 years hence.

We know that Bedouin are still settling and becoming sedentary villagers. We do not know at what rate this sedentarization is taking place at the present time. The fact that Bedouin will settle, or severely curtail their transhumance, almost anywhere that government buildings are



erected and there is water indicates that the sedentarization rate is potentially very high. Both Chatty (1979) and Asmon (1978) concur that many villages are being set up in areas of Al-Hasakeh, Deir-ez-zor, and Al-Rakka where the water supply is tenuous. We know about the lack of other social services in these villages as well.

Seen within a conceptual framework where groups have the potential for changing status, the middle path allows the inevitable changes which are the result of the growth of power of the central state and the improvement of communications within that state, namely, that more and more of the steppe comes under its control. This policy also lets this change flow along traditional channels, allowing the Bedouin to adjust to it within ways which seem reasonable to them.

The question, however, is whether or not the policies presented in this discussion will be or even can be implemented quickly enough to have an effect on slowing the rate of de facto sedentarization already taking place. The increase in the size and number of cooperatives will only be impressive if the services which allow a continuation of the pursuit of animal husbandry as a full-time enterprise soon follow. Without growth in the delivery of these services, the sedentarization rate will continue as it is, perhaps adding significantly to the urbanization of Syria and the cultural dislocation of its population. Basic demographic research is badly needed, for the basic sedentarization rate is unknown and therefore one can only speculate on its effects.

A second and not unrelated assumption is that the Bedouin were somehow independent of the more humdrum world outside. The image exists of the Bedouin as a "free spirit" riding out across the steppe. In fact, the Bedouin have always had to maintain close connections with the urban and agricultural sectors of the country, both to sell their products and to obtain those needed items which their own limited economy was unable to provide.

The current policy attempts to further solidify the Bedouin's interdependence with the world outside while at the same time improving his position within economic transactions. By making the Bedouin less dependent upon climate through supplemental feed and by assuring him a ready and fairly stable market for his products, the Bedouin is brought into the mainstream of the national economy.

That economic interaction takes place between the various sectors of the Syrian economy (the range, the agricultural village, and the urban merchants) should be assured. Separatist or isolationist argument overlooks this simple fact of life. The question is not whether the Bedouin will or will not participate in Syrian life as a member of the nation as a whole. The question, rather, is the terms of that participation. Although, as we have pointed out, many elements of this program are as yet only minimally applied, the philosophy under which it operates represents a step forward in outlook and provides the Bedouin with the potential of dealing as equals with the other sectors of Syrian society.



## 12. Conclusions and Recommendations

### 12.1 Social Service Delivery

It has been noted that social service delivery on the steppe is extremely limited at present. It is also important to note that very little is known about how to efficiently deliver such services on the steppe.

There have been too many statements about the reluctance of Bedouin to accept modern medicine and education, when most evidence points the other way (cf. Ibrahim and Cole 1978). The Bedouin often have too little contact with either to be able to reject them.

Bedouin can and do accept new practices and technologies when they are useful. The acceptance of the pickup truck proves this. Bedouin can and do accept Western medicine for themselves and veterinary care for their animals. Bedouin can and do want their children to be educated. Most reticence is due to unfamiliarity or the difficulties of distance and family need. If good service is provided, that reticence will soon disappear. This we have seen in the growth of the Essyrieh Training Center.

The recruitment of personnel from the outside to work on the steppe has proved to be a major problem. The question becomes, therefore, one of how to provide maximum services with the fewest outside workers. I am convinced that the delivery of social services on the range should be connected to and an integral part of the functioning of the cooperatives. To do this, however, it will be necessary to invent and build a successful cooperative-based program for the delivery of social services which can be set up on every coop. Taking personnel shortages into account, a successful core program should include the following:

1. Programs should use locally hired people wherever possible, which means that any module must involve local input in planning and include adult education as part of its program.
2. The curriculum for children must include the standard Syrian curriculum in respect to the desires of the Government of the SAR. The Bedouin must be considered an equal citizen within the nation.
3. Minute changes in schedule must be made to adjust the school year to the needs of the Bedouin which are the result of their yearly transhumant cycle.
4. An education program must be developed in such a way to maximize delivery while minimizing cost of delivery. Other means of locating school services may prove more efficient than a "central module" concept. This possibility must be explored and experimented with, perhaps as part of the second stage of the development of this program, with the addition of schools to other cooperatives. Personnel for these schools can come from participants in the

Essyrieh School development phase. The personnel for the third phase will come from participants in the second. In this way, the employee development of each phase could carry with it the seeds for the development of the next level. Care must be taken to develop each program at each level.

5. Effort in social service delivery, however, must not be confined to education. Health services for humans and for animals are a necessary component of any social service delivery program within a coop. Personnel problems and difficulty in recruitment would necessitate training local people at a "barefoot doctor" level or as veterinary technicians. A cooperative vehicle must be assigned an ambulance function and be kept available for emergency situations. Breeders could learn to treat a range of the most common diseases in an area. Traveling veterinarians are a possibility, but recruitment will be difficult.

## 12.2 Range Improvement Programs:

Boykin and Khoury (1979) present a detailed analysis of the range improvement program as well as comments and recommendations. I would emphasize two points, however:

1. Any range improvement program must be based on controlled grazing. Some means must be developed to limit the number of sheep grazing at any one time. The present policy of allowing feeding of any number of sheep under the government-controlled feeding program must be utilized only as a temporary measure for the purpose of recruiting and organizing cooperatives. Strict enforcement of grazing sanctions and anti-ploughing laws must be continued, but an effort must be made to maximize the communications function of these procedures.
2. Support for programs against cutting of shrubs for fuel need to be combined with programs introducing the technologies of alternative energy sources. Programs introducing solar cookers and other similar types of technology should be instituted and supported. In addition, wind-driven pumps and generators should replace deisel-powered pumps and generators wherever possible in the Badia. The cost of deisel fuel for these uses is better spent in other areas of programming.

## 12.3 Overall Programming - Comments and Ideas:

From the anthropologist's point of view, the Syrian Government's present program represents a real attempt to come to grips with the inherent problems in the relationship between sedentary and semi-nomadic groups. On the other hand, as it stands, one is disturbed by the fragility of the entire program. Only a small percentage of the range has been replanted with Atriplex and other shrubs, and an even smaller percentage of that land is being even loosely protected. Although those who work in the area are adequately trained and highly dedicated, it would only take one set of poorly trained or corrupt officials to undo

much of what has already been accomplished. The limited number of dedicated people present increases the likelihood that this could take place.

There is only one school on the steppe, and that has been closed for five of the ten years of its existence. The supply of teachers who are dedicated enough to work in the steppe is highly uncertain. One of the two teachers hired for 1978 left at the beginning of the term.

Feed deliveries appear to be made in a timely fashion, and that part of the program appears to be expanding as new cooperatives are formed for distribution. New warehouses are being built for storage and more money is being contributed for the various revolving funds which enable breeders to make their feed purchases on credit. At the same time, as feed security increases, so does the size of the flocks.

The new policy which monopolizes the distribution of feed under the cooperatives, eliminated the ceilings on the number of sheep allowed to be fed under national programs. This may be good for the short-term goal of increasing membership in the coops and speeding up the concomitant territorialization of the steppe, but as a long-term policy it would be disastrous. The long-term success or failure of this entire project rests on biological, not political, realities. This again makes the success of the overall program very tenuous.

The program of water delivery is continuing, with new wells being dug, and old wells and cisterns being cleaned out. Surface dams are being built and water-spreading techniques tried. This experimentation is a good way of working in an unknown situation. Again, however, increased water supplies lead to increased flock sizes. Localization of water leads to concentration of these animals around the wells in times of drought. As in the Sahel of Africa, such a concentration of animals can lead to a very rapid deterioration in the local environment.

Presently, attempts are made to deliver water in some areas of the steppe by tank truck. These trucks, however, are notoriously unreliable. The increased price of fuel will no doubt make this even more unreliable in the future. Some Bedouin own tractors and use them to haul smaller water tanks. This provides a more reliable temporary solution to the problem of water distribution. In the long run, however, new solutions will have to be found.

The pickup truck and other forms of motor transportation permit the Bedouin increased range and security in the Badia. At the same time, the pickup is causing its own form of deterioration of the steppe and threatens much of the grass cover which remains. One must begin looking for ways to combat this form of destruction on the steppe.

Overall, then, there is a program with a major function of increasing the security of the Syrian semi-nomad, while decreasing his dependence on the year-to-year changes in climate. At the same time, the program attempts to bring these people into the mainstream of Syrian life as equal citizens with a stake in the nation while allowing them to come in on their



own terms in their own way. The program is in its earliest phases and is weak, tenuous and often expressed in hopes and on paper. The shortcomings, however, are not in ideas. Most of the programs are well thought out and involve cautious development phases and slow introductions. The people who devised these programs did not say the problem was too big; they picked a point to begin and started.

Support should come in the following areas:

1. Support for training for MAAR personnel in range management in university programs overseas. This is for the purpose of building up personnel to work in conservation programs on cooperatives and in the centers in the field on the steppe.
2. Support the development of training programs of MAAR officials in country, on the job, in conservation, special veterinary problems, resource development and so on. This is to train a group of second-level people to support those trained in Item 1 above and to provide a group that can act as extension agents on the steppe.
3. Support training programs for the Bedouin themselves to develop field workers and/or cooperative specialists such as paramedical and paraveterinary specialists, as well as general extension programs to increase the breeders' participation in range management. These latter should involve two-way flow of information so that steppe programs' officials can be made aware of problems which might develop out of their programs in order so that they might be adjusted to better suit everyone's needs.
4. Support through technical aid, not just through the supply of cars and trucks to help in delivery of programs and enforcement of conservation measures, but also support in the form of limited technology or alternative energy items (such as solar cookers) to help support conservation measures.
5. Support in the social service delivery sector. An educator or similar expert is needed to help develop a program of delivery in education for the Bedouin. This would involve very little change in the curriculum, for that would be undesirable to the principles of the host country, but would involve developing an educational module which could be effectively started within every cooperative center. One sheikh I talked to expressed an end goal of development as "a school at every well." A school in every cooperative would be a sufficient victory of the principle.
6. As part of the development of a social service component to the cooperatives, a health component has to be added as part of the service module. The desert environment of the Bedouin produces in them a host of diseases which are not prevalent in the rest of the population. Conjunctivitis from the dry winds and dust storms, infectious diseases such as measles, cerebrospinal meningitis, venereal diseases, tuberculosis, nutritionally related



diseases such as hemorrhoids and parasitic diseases such as malaria and schistosomiasis create great human suffering which demand that some sort of health care be delivered as part of the policy of improving the lives of the Bedouin groups. Since nothing has been done thus far, the entire module can be developed as a total system, but delivery should be supported to at least bring the level up to that of the rest of the country. The problems of personnel and budget could perhaps best be solved by the "barefoot doctor" or paramedical approach, especially since cures for these diseases and hygiene approaches are all relatively simple. A vehicle\* should also be assigned for temporary duty in more serious cases to take those stricken to health centers. The health sector needs development in many areas of the SAR and the steppe is certain not to be of the highest priority. Minimal training does need to be given to some, and health and sanitation training as well as vaccinations given to all in the near future. Syria's long-range health goals should be planned to allow an input for these future modules.

7. Support is already being given to potable water projects, especially on the periphery of the steppe in Al-Hasakeh and Al-Rakka (cf. Chatty 1979, and Asmon 1978). These projects center on areas which are more densely populated by settled or transitional villagers, but only marginally affect semi-nomadic groups. While these programs are expensive, it should be remembered that potable water is a problem in many areas. This type of project perhaps should be considered as part of an extension of services delivered by the cooperative core. The geographic extent of these programs can be expanded by setting goals for delivery of pure water on each coop. But since wells differ greatly from area to area in contamination and mineral composition, these programs should follow extensive analyses of clusters of wells on every cooperative.
8. Future consideration should be given to support of alternative energy sources for generation of electricity and pumping of water (through windmills) as well as alternatives to the traditional sources of cooking fuel (by, for example, substituting solar cookers for shrubs as fuel for cooking food and making coffee\*). This would supplement range conservation efforts already in practice, while substantially easing day-to-day labor and improving the well-being of Bedouin and other semi-nomadic groups. The steppe could provide a testing ground as well for various types of mechanisms, which in turn would strengthen the cooperative idea by providing additional services for members.

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\*Coffee is cooked in a separate hearth; thus, two solar units would be needed--a small unit for coffee and a large unit for food.

\*Consideration should also be given to the use of helicopters for a mobile health service, in coordination with the Ministry of Defence.

9. Support must be given to basic research, for the biggest questions remain unanswered. We do not know basic things such as the rate of sedentarization or its effect. The question of how to limit flock size, or how to enforce territory can only be answered when more is understood as more is known about the Bedouin themselves. To paraphrase Dr. Draz, it is not enough to make rules or policies; those policies must be in line with the patterns and expectations of the people. And if they are not, they simply will not be obeyed and the project--any project, no matter how environmentally sound--must fail. We must know more about those expectations if these policies are to succeed.

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Syria: Agricultural Sector Assessment

Volume 5: Human Resources and Agricultural Institutions Annex

CHAPTER V

LAND TENURE IN THE EUPHRATES BASIN

By

Wyn F. Owen

TABLE OF CONTENTS

	<u>Page</u>
5.1 Introduction	1
5.2 The Euphrates Dam in Regional Perspective	1
5.3 Project Development Area	3
5.4 Some Details on Land Tenure and Farm Organization in the Euphrates Project	9
5.5 The New Irrigation Land Areas	15
5.6 Some Tentative Conclusions and Suggestions	20





## 5.1 Introduction

This preliminary report focuses primarily on the Euphrates River Basin and the areas therein that the government hopes to bring under new or improved irrigation as a result of the construction of the Euphrates Dam at Al-Thawra (officially completed March 1978). It describes and comments upon existing and experimental forms of farming organization in the area and some of the constraints and opportunities that need to be taken into account in formulating future agricultural sector investment priorities. The report is designed to provide background and to stimulate discussion and to focus further analysis.

The report is based on data drawn from several official documents and information assembled in discussion with about forty representatives of several Syrian Government Ministries (Planning, Agriculture, the Euphrates Dam, and Labor and Social Affairs) and international organizations and farmers organizations during a visit in late 1978. Needless to say, it suffers from the shortcomings of any "birds-eye" view of an extremely complicated subject, and the writer apologizes in advance and assumes full responsibility for any resulting errors of omission and misinterpretation.

## 5.2 The Euphrates Dam in Regional Perspective

The Euphrates Dam is one of the world's ten largest dams and is an extremely impressive engineering achievement. It provides 12 billion m<sup>3</sup> of storage for water on a river with an annual flow of 27 billion m<sup>3</sup>. Lake Assad is about two-thirds the size of Lake Nasser in Egypt. The dam has the capacity to produce 2.5 billion kw/annum of electric power, also approximately two-thirds the capacity of the Egyptian High Dam facility. A main canal, currently under construction, will be capable of discharging 140 m<sup>3</sup>/second of irrigation water, and a set of six main pumps and three secondary pumps in the final stages of completion some miles up-stream will have the capacity to lift water from the reservoir (a 90 m lift) at a rate of 36 m<sup>3</sup>/second to the land of the Maskane Plain (and perhaps also to part of the Aleppo Plain) to the south and southwest of the reservoir. The network of needed canals and drains, which may well take some twenty years to complete, is expected ultimately to add about 425,000 hectares of new irrigated land and to substantially upgrade the approximately 145,000 hectares of land that is presently under irrigation along the banks of the Euphrates between the Dam and the Iraqi border.

Essentially all of the land involved in the extension and upgrading project lies outside the 250 mm isohyet which roughly marks the limit of rainfed agriculture in Syria. As a result, the development will be superimposed upon a relatively poor, widely scattered, and remote rural economy comprising interdependent components of irrigated land--a narrow and discontinuous strip of river bank land which has in the past been highly vulnerable to annual floods (between October and May)--and a vast expanse of surrounding arid land. The latter rapidly grades off to true desert

and is capable, in the western areas only, of supporting limited and variable rainfed cereal production (barley and low-yield wheat) and (primarily) semi-nomadic, sheep and goat raising. The latter traditionally has also been highly exposed to frequent droughts and is considerably dependent upon the river bank and the higher rainfall zones beyond the desert to the north and to the west for much of its base and reserve feed supply. As a local indicator of this interrelationship, a prior survey of the area subsequently flooded by the dam on the western extremity of the development area found that 8 percent of the farmers there had access only to rainfed land, 28 percent had irrigated land only, and 66 percent had a combination of both types of land in their holdings. On a broader scale, the Euphrates Valley is linked by road and rail along the Khabour River Valley to the highly productive lands in northern Al-Hasakeh; this Province accounts for a third of Syria's wheat production and represents a source of hay and other livestock feed of considerable significance at current levels and an even higher future potential.

In 1976 the two principal provinces (Mohafazat) in which the projected development lies, namely Al-Rakka and Dier-ez-zor, accounted for the following proportions of the nation's agricultural production and livestock numbers: cotton, 37.4 percent; barley, 24.5 percent; wheat, 15.5 percent; sheep, 19.4 percent; goats, 9.2 percent; and cattle, mainly in Dier-ez-zor, 7.3 percent. This production in turn was very highly dependent upon the approximately 30 percent of the nation's then irrigated land that lies along the Euphrates in these two provinces. Irrigated land accounted for 13 percent of the total cropped area (519,231 hectares) in Al-Rakka and 62.6 percent of the same (164,520 hectares) in Dier-ez-zor. Rainfed cropping (451,264 hectares in Al-Rakka and only 61,592 hectares in Dier-ez-zor) was essentially limited to barley and low-yield local varieties of wheat. Dier-ez-zor, with 45.0 percent more irrigated land than Al-Rakka, has traditionally outplanted the latter in both summer crops (cotton, sesame, corn, and vegetables) and winter crops (Mexican wheat and barley) and also in fruit trees, and these in their contribution to total value of output have no doubt more than made up for the province's relatively limited supply of rainfed land. Lentils, a minor winter crop, are more widely planted in Al-Rakka than in Dier-ez-zor.

The traditional rotation of crops in the rainfed area focuses around wheat or barley (planted in October or November and harvested in June), followed to a limited extent with a planting of sesame. In the irrigated areas these crops are supplemented by cotton (planted in April or May and harvested in September), sesame, some vegetables and corn, or millet and fruit. In the higher risk rainfed lands, cropping is limited to barley or to the poorer yielding local varieties of wheat with half the cropable land left fallow each year. The sheep economy traditionally has relied heavily on grazing crop stubbles for nine to ten months of the year, supplemented by grazing the more remote lands during the rest of the year. Much of the grazing, with respect to which crop stubble in an unfenced farming area is essentially considered a "free

good," is managed by shepherds (Raché groups) grazing flocks of 100 to 1,000 sheep, many of which now-a-days have motorized transport facilities and financial backing from urban or family investment partners. In recent times, feeding of supplements in addition to stubble grazing has expanded, especially against a background of overgrazing the steppes (desert land). The future of the livestock industry is now dependent, in a very large measure, on additional and new resources of forage crops and concentrates.

The two focal provinces are relatively sparsely populated with only 8.3 percent of the country's population (613,000 people) in 1975 and 16.5 percent of the "cultivable" land (including 31 percent of the irrigated land). On the other hand, the relative economic backwardness of the two provinces is indicated by the fact that in the same year 73 percent of their population was rural (vs. 54 percent for Syria as a whole), and the male illiteracy rate was 57 percent (vs. 32 percent for the whole country). A pre-survey of the inhabitants in the area subsequently flooded by Lake Assad (10,766 families and 62,000 individuals) found 82 percent of that population to be illiterate.

In spite of the relative backwardness of the people and the region by many measures, it deserves to be stressed that by reason of its pastoral/crop land interdependence, the presence of cotton as a cash crop for some two generations, and the historical role of the Euphrates as a long-distance thoroughfare, the area also has a tradition of exchange rather than narrow based subsistence. Also, while many tribal customs prevail, in most areas different tribal groups have been living together in the same villages and towns for many years, and even the remote desert tribal areas have been subjected to the centralized legal system of the Syrian nation-state. (See Manzardo's report.)

While the problem of frequent seasonal flooding has now been eliminated with the completion of the Euphrates Dam, certain other prior problems remain. Important among these is the land lost or partially lost to salinity along the Euphrates Valley. It has been estimated that 10 percent of the past irrigated land on the river (about 16,000 hectares) is no longer cropable in its present state of salinity and in addition, that there is a 50 percent loss in productivity on over 20 percent of the remaining area (or on about 35,000 hectares). A second problem of note is a considerable degree of fragmentation of holdings in the older irrigated lands due to continuing subdivision in the inheritance process.

### 5.3 Project Development Area

Against this background the potential impact of the projected improvement and expansion of the irrigated lands in the two provinces appear large. The full development, if brought to fruition, will almost double the irrigated land resource of the entire country, and multiply by several factors the relative contribution of the northeast region to overall agricultural production. The projected intensification of cultivation on land currently supporting



very marginal rainfed crops, if any at all, will be equivalent to almost 30 percent of the land in Syria that falls in the so-called No. 1 Stability Zone (that is land with an average annual rainfall of over 350 mm and which receives over 300 mm in two out of three years). Its efficient development is therefore of strategic importance to Syria. Among the many critical factors which will determine the success of the development, of fundamental importance is the economic viability of the system of exploitation of the new and improved lands that is adopted. This will be true both from a macro (or overall agribusiness systems) sense and in terms of its micro (individual farm unit) dimension. The development will involve the conversion of substantial areas of very extensively used lands at the present time into highly intensive forms of land exploitation and will require supporting organizational innovation. There is a need and some latitude for experimentation in this regard, but the economy can ill afford any very costly mistakes in such an important component of its overall development program.

A total of 570,000\* hectares has been identified as potentially irrigable under the influence of the Euphrates Dam, and the engineering aspects of the needed canal and drainage system and supplementary pumping stations are also already in an advanced stage of planning and implementation on a pilot basis. The responsibility for implementing the development in the new area has been assigned since 1968 to the General Administration for the Development of the Euphrates Basin (GADEB), a special section of the Ministry of the Euphrates Dam. The GADEB in turn has subsections responsible respectively for Irrigation, Agriculture, and Social Affairs. For ten years GADEB has been engaged in preparatory work in anticipation of the completion of the dam. Furthermore, since the plan is to continue to irrigate the right bank of the Euphrates directly from the river or river bank wells, and to irrigate the Meskane Plain by pumping water from the reservoir (for which pumps are already in place), it has been possible to begin to implement parts of the project prior to the completion of the main (left bank) gravity canal, which will be fed from the dam.

Thus, as of the end of 1978 a total of 20,000 hectares of new land has been brought under irrigated cultivation in fifteen GADEB-managed farms, on lands bordering to the north and west the old mid-Euphrates irrigated lands (the so-called Pilot Project), and

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\*The figure of 640,000 hectares commonly used to describe the dam project includes 70,000 hectares from the lower Khabut River which will be irrigated from another dam and administered by the Major Projects Administration and not the Ministry of the Dam.

The 570,000 hectares includes about 145,280 hectares that were irrigated prior to the building of the dam. Most of this old irrigated land is to be reorganized and upgraded as an integral part of the development of the overall irrigation system dependent on the dam. The projected net increase in irrigated land is, thus, approximately 425,000 hectares.



a total of 3,400 hectares of old irrigated land in the mid-Euphrates basin has already been renovated and reallocated to farmers. Also about 1,150 hectares of a projected government farm of 4,000 hectares on the Meskane Plain was cropped on an experimental basis in 1978. This farm, which is being developed with assistance from the USSR, is programmed for completion in 1979 and is surrounded by an additional 17,000 hectares; the state-owned part of these 17,000 hectares is expected to be developed in similar types of farms in 1980.

In addition, a dairy farm with a planned capacity for 600 milking cows was established near Rakka in 1974 and had been expanded to about half its potential capacity by the end of 1978. Some experimental work has also been carried out by GADEB in the establishment of orchards and forest crops, in goat rearing, and with new crops such as sugar beets and rice. Several studies of both the physical and the human resources in the area have been carried out and several short-course training programs for agricultural technicians, mechanics, office workers, and farmers have been held at the Rakka headquarters. (See Information Assessment Report.) What has already been accomplished is thus quite significant and impressive, although in contrast to the magnitude of the overall project, and the problems associated with almost every facet of it, the research and planning efforts to date represent the barest minimum, and the future risk of sizable and costly implementation costs due to a high component of impromptu decision-making must be judged to be very real.

The accompanying Table 1, and following summary information will help identify the projected land development areas, accomplishments to date, and immediate goals in more precise terms. There are three separate major blocks of land earmarked for development. The first of these involves approximately 155,000 hectares in the Meskane Plain lying to the south and west of the reservoir. About two-thirds of this area (West Meskane) is in the Aleppo Mohafaza and the remainder (East Meskane) in the Al-Rakka Mohafaza. Only 6,333 hectares of this Meskane Plain land had been previously irrigated. The 155,000 hectares are designed to be watered from the new pumping stations on the reservoir.

Straddling the border between the provinces of Aleppo and Al-Rakka is a 21,000-hectare portion of the Meskane Plain which is programmed to be developed in consolidated "State" or "Government" farms. The development work on the first of these (the 4,000-hectare farm already mentioned that is being financed and developed in cooperation with the USSR, and is already partially under experimental cropping) should be fully completed by the end of 1979. At least five other farms and one large-scale dairy farm, similar to the one already at Al-Rakka, which will be described in more detail later, are programmed for development by Syrian firms during 1980 on the balance of the 21,000 hectares. A contract has also been let to a Japanese firm to undertake the preparatory irrigation and drainage works on the remaining 29,000 hectares of East Meskane; the expected completion date is the early 1980s for

TABLE 1: EUPHRATES PROJECT: MINISTRY OF THE DAM

Region	Previously Irrigated	Estimated <sup>a</sup> Total Irrigated Land after Development	Estimated Increase in Irrigated Land
1) Balikh <sup>b</sup>	25,415	158,000 <sup>a</sup>	132,585
2) Euphrates Valley			
Middle	22,130	25,000	2,860
<u>Lower</u>	<u>91,402</u>	<u>167,000</u>	<u>75,598</u>
Total	113,532	192,000 <sup>a</sup>	78,458
3) Meskane (Aleppo) Basin			
East	n.a.	50,000	
<u>West</u>	<u>n.a.</u>	<u>105,000</u>	
Total	6,333	155,000 <sup>a</sup>	148,667
4) Ressafe	-0-	25,000 <sup>a</sup>	25,000
5) Meyadin	<u>-0-</u>	<u>40,000</u>	<u>40,000</u>
TOTAL	145,280	570,000	424,720

<sup>a</sup>These original estimates of total area probably exceed what will actually become available, since problems of salinity are exceeding expectations in the Middle and Lower Euphrates Valley; difficulties with gypsum are evident in the Balikh, Meskane and Ressafe regions.

<sup>b</sup>In this Balikh Basin, a total of approximately 23,400 hectares has been reclaimed and resettled (20,000 hectares of new land, and 3,400 of old land).

this work. The rest of the Meskane Plain, West Meskane, totals about 105,000 hectares mostly in Aleppo Province. The canal development for this area has been assigned to the section of the Ministry of the Dam which supervised the construction of the dam itself (GOED).

The second, and central and major block of land which is projected for development, all lies in Al-Rakka Mohafaza. It totals about 208,000 hectares and has three main parts: (a) the Middle-Euphrates Plain of approximately 25,000 hectares most of which has been irrigated for years by pumping water from the river or river bank wells, and which is scheduled for reorganization to receive water either from the main canal on the left bank or from improved pumps on the right bank. The area already benefits from the elimination of annual flooding as a result of the dam, but a reorganization of the existing irrigation and drainage system is essential if only to protect it from the water logging and salinization that would otherwise result from seepage from the new areas to be developed on the bordering higher land. This reorganization work is being initiated by a Rumanian firm and the first part, an area of 3,400 hectares, was completed and reallocated to farmers in November 1978 (to be discussed in more detail later). It is projected that the reorganization of a further 5,000 hectares can be completed in this area during 1979 and another 6,000 hectares in 1980 (considerably short of an initial aggregate target of 27,000 hectares for the three years). (For more details, see Havens's report.) (b) The Balikh Basin area, a large area totaling about 158,000 hectares bordering the north side of the old irrigated land on the Middle Euphrates around Rakka and extending northward along the Balikh River. This area, in turn, is divided into seven subsections. Advanced development to date in the Balikh Basin has been limited to the Pilot Project involving four scattered sites along the northern fringe of the river valley (Al-Faid Valley, Assalabeyat, Al-Hamrat and Asswadieh). These four pieces totaling 20,000 hectares had all been developed and settled by the end of 1978 in fifteen Pilot Project settlements varying in size from around 1,000 to 2,000 hectares each (further discussion of these follows later). It is anticipated that work on an additional 10,000 hectares in the Balikh Basin will be completed during 1979 in the Beer Al-Hashim portion of Section 1. This work is being done by Syrian firms. Studies are also continuing on the remaining Balikh Basin lands and tenders are expected to be called for work on another 30,000-hectare section in 1979. Only 25,415 hectares had been irrigated prior to the initiation of the project. (c) Finally, this large central block contains an area of some 25,000 hectares in the Rasafe Plain, which extends southeast from the eastern end of the reservoir and south of the river. This area, which is to be irrigated from special pumps on the reservoir involving a 40 to 70 m lift and a 30 km main canal, is programmed for implementation during the next five years.

The third large development block lies almost entirely in the Dier-ez-zor Mohafaza and expands the currently irrigated lower Euphrates basin of approximately 91,000 hectares into a total of



167,000 hectares, and an area of about 40,000 hectares lying along its southern central portion (the Meyadin Plain). In this entire developmental block of some 207,000 hectares little advance work has been done. However, a contract has been granted to a French firm for reclamation work on a portion of the upper part of the Lower Euphrates Basin which has the most serious salinity problem. In addition to the prior engineering studies by the French firm, the GADEB Social Affairs Section is undertaking some survey work in the area.

In summary, in what amounts substantially to an international irrigation development effort, as of the end of 1978: (a) 20,000 hectares had been reclaimed and settled in the Pilot Project farms, and 3,400 hectares of old land had been reorganized; (b) it appears reasonable to expect that a further 4,000 hectares will be fully reclaimed and settled as a Government Farm in Meskane and a further 5,000 hectares will be reorganized and distributed in the mid-Euphrates basin in 1979; and (c) by the end of 1980 an additional 27,000 hectares probably will be reclaimed and settled (including 17,000 hectares in East Meskane near the Government Farm and 10,000 hectares in the Beer Al-Hashim area) and an additional 18,000 hectares of old irrigated lands of the mid-Euphrates should also be able to be reorganized and redistributed. That is, by the end of 1980, 51,000 hectares of new land can likely be brought under irrigated culture under present plans and a total of 27,000 hectares of old land should be able to be reorganized and returned to production. All this would represent about 10.7 percent of the total new land development goal and about 16.6 percent of the long-run goal for old land conversion.

During the next two years, the responsible officials in GADEB also hope to learn a great deal more about the potential of the project and problems of implementation. On the engineering and physical side, among the important challenges are problems associated with a high gypsum content in the soils of at least the Balik Basin and Meskane Plain; the problem of dealing with accumulated salinity on the river bank lands, and the problem of achieving adequate leveling for effective flow irrigation or alternatively of substituting sprinkler irrigation over large areas. Without the latter, there will need to be a great deal of rethinking of the practicality of large-scale mechanized farming from an engineering viewpoint, quite apart from the economic and social questions that this widely publicized objective entails. In this connection there is a clear need for detailed consideration of the socioeconomic and organizational challenges that the settlement phase of the project presents in terms of both forms of land tenure and forms of farm and agribusiness organization and management. The remainder of this report will be addressed more specifically to this question by looking in more detail, although in a very preliminary way, at the existing farming system in the area and the experimental content of the initial efforts to settle and farm the pilot areas of reclamation and reorganization. The issue boils down to: (a) the relative priority that should be given to the development of new land in contrast to the reorganization of old land;



and (b) in the process, the degree to which the form of exploitation of the new lands should be based more or less upon the experience and talents of individual farmers in the old irrigated lands or, correspondingly, more or less on tested forms of collective farming organizations. What must be assumed is that the primary mode of development should be consistent with the stated objectives of the leadership of the country, namely, the protection and promotion of freedom, unity and equality in the republic. Otherwise, the question appears to be quite open to analysis and not by any means foreclosed by existing commitments to any particular farming system.

#### 5.4 Some Details on Land Tenure and Farm Organization in the Euphrates Project

A number of studies have been completed or are in process relating to the prevailing system of land tenure and farm and agribusiness organization, both in Syria generally and in the Project area in particular, which can serve to provide some insight into the area's main characteristics and potentials of various forms of farm and agribusiness organization. The many issues involved, however, warrant considerably more detailed review and analysis than the writer was able to do in the time available to date. Considerable primary data collection is also needed. However, based on some initial survey data generated by the GADEB Social Sector, the following characteristics of the existing farming system in the projected development area are worthy of note. Attention is addressed first to the area currently under irrigation in the mid-Euphrates Valley between the dam and the border between the provinces of Al-Rakka and Dier-ez-zor.

A social/economic survey of the Middle Euphrates Basin completed by GADEB in 1978 established the following information: A population of 51,145 in the area was distributed among 7,700 families (6.6 members per family) and lived in 45 villages (171 families per village). There were 21,032 hectares of irrigated land and no rainfed lands. (See Table 2.) Holdings of all types (residual privately owned land, redistributed private land\* and privately allocated State land\*\*) of 3 hectares or less constituted approximately 50 percent of all holdings and occupied 21 percent of the land. Land still held in private ownership (i.e., excluding both requisitioned and State land redistributed under the Agrarian Reform Program) comprised 66 percent of the land; 35 percent of the families in the area owned some land privately. However, those

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\*Usually referred to as Agrarian Reform Land.

\*\*Certain public domain or State land was also distributed under a companion part of the Agrarian Reform Program, but like the redistributed land that had been requisitioned from large landowners, remains separately identified from the historical, privately owned land which involves less restrictive title rights. The Agrarian Reform Program was initiated in 1968.

TABLE 2: LANDHOLDING PATTERNS IN 45 VILLAGES  
IN THE MIDDLE EUPHRATES BASIN

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1)	Total population :	51,145
2)	Hectares of land :	21,032 (all irrigated)
3)	No. of families :	7,700
4)	No. of families holding land :	2,700 (35%)
5)	Holdings of 3 ha. or less :	50% of all holdings, and 21% of land area
6)	Holdings of more than 10 ha. :	11% of all holdings, and 30% of land area
7)	Land in private holdings not created by State redistribution programs :	13,880 ha. (66% of land)
8)	Land redistributed -	
	a) from expropriated farms :	4,373 ha.
	b) from State land :	<u>2,717 ha.</u>
		7,090 ha. (33.7%)
9)	Beneficiaries of land reform who received less than 3 ha. (59% of all beneficiaries) received :	2,130 ha. (30% of land redistributed)
10)	Beneficiaries receiving more than 10 ha. (1.7% of all beneficiaries) received :	570 ha. (8% of redistributed land)
11)	Tenure -	
	a) wholly owned farming operations (4.4 ha./family) :	2,460 families (91.7%)
	b) partly owned, partly rented farming operations :	165 families (6.0%)
	c) nonfarming owners :	<u>75</u> families (2.3%)
		2,700 families (100%)

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owning over 10 hectares (3.9 percent of all families in the area) held 30 percent of the privately owned land. Among the private owners 91 percent farmed all of their land themselves and a further 6 percent farmed part of their own land. That is, there were only 75 (or 3 percent) nonfarming landowners and these owned only 844 hectares (or 4 percent of the land in the area). This land together with what was rented to other farmers by those in the previous category (a total of 1,038 hectares or 5 percent of the land) was rented to 1,838 tenants and part-tenant farmers with 46 percent of the pieces of land rented being under 3 hectares and only 4.4 percent being over 10 hectares. The amount of land farmed by recipients of land requisitioned from private landlords and redistributed under the Land Reform Program (which, in the mid-Euphrates basin involved the redistribution of 4,373 hectares of private land and 2,717 hectares of State land), amounted to 33.7 percent of the land in the area. Beneficiaries receiving less than 3 hectares constituted 59 percent of recipients and these received 30 percent of the land redistributed. Only 1.7 percent (all State land recipients) received over 10 hectares and these largest area beneficiaries received 8 percent of the land distributed. Finally, the study also revealed that 86 percent of the families now farmed land falling in only one of the four tenure classifications of (1) privately owned land, (2) agrarian reform land, (3) allocated State land, and (4) land leased from private owners. Among the 14 percent of farmers with land in two or more of these tenure classifications, 57 percent owned part of the land they farmed, 26 percent were recipients of requisitioned private land and 17 percent were recipients of State land under the Land Reform Program.

The following general conclusions may be drawn from the above: (a) the Land Reform Program clearly had a considerable impact on the distribution of land wealth in the area surveyed as it did throughout Syria;\* (b) it did, however, leave a sizable and indeed expanded proportion of quite small landholdings (approximately 50 percent under 3 hectares and about 30 percent under 2 hectares); (c) there has been a significant movement in the direction of farmers' accumulating larger amounts of land in their farm enterprises by combining lands from two or more of the four tenure categories identified above; (d) at the same time, there are still relatively few farmers operating areas of irrigated land in excess of 10 hectares--these would probably not exceed 5 percent of the farmers or more than 20 percent of the farming land; and (e) a sizable portion of the active farmers--probably one-third or more--is farming individual or combined tenure category holdings of between 4 to 8 hectares and this group is exploiting about the same fraction of the total land resources. Lastly, (f) while data are not available on

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\*Under the Land Reform Program, up to 1975, 12.6 percent of all irrigated and tree planted private land (or 68,000 hectares) was expropriated and 89.3 percent of this was redistributed. In addition, 23.2 percent of rainfed private land (or 1.148 million hectares) was expropriated, and 35.3 percent of this was redistributed.



the relative land productivity or incomes of farmers by different total area sizes of holdings, it is reasonable to presume that the 368 (6 percent) farmers who participated in the process of farm enlargement through renting additional land were economically motivated to do so. In the process these farmers enlarged their farming units from an average of 3.57 hectares to an average of 9.57 hectares. It is noteworthy that those combining owned and rented land in their farms led the process and increased their average farm sizes from 4.36 hectares to 12.09 hectares. By contrast, farmers who had access only to rented land had average farming units of 3.6 hectares and those whose holdings were limited to land received under the Land Reform Program had an average of only 3 hectares. Pure owner-operators fall in between with an average farm size of 5.61 hectares. Such data clearly deserve to be considered in allocating any of the new irrigation land developed under the project to individual farmers. They suggest that in addition to whatever land may be allocated to owner-operators, a proportion of the land might be made available to entrepreneurial farmers on a competitive rental basis as a stimulant to increasing efficiency over time.

As a by-product of the impact of the Agrarian Reform Program in the irrigated mid-Euphrates basin, farmers' cooperatives exist throughout this area. Also, the Peasant Union, which played a major role in the relatively peaceful land requisition/redistribution process in Syria, continues to play an important and indeed, increasingly important leadership, coordination and administrative role in the overall organizational structure within which the small farmers in general, but Agrarian Reform beneficiaries in particular, now operate. Under the Agrarian Reform Law membership in a cooperative was made mandatory of all recipients of land, although membership is also open to other farmers. More recently (1975) the Peasant Union and the Farmers' Cooperatives were merged at the village level (or small groups of villages) into what are now referred to as Farmers' Societies. One of the frequently stated objectives is the elimination of unnecessary duplication of effort. However, it has also had the effect of combining the political (union) and the economic (cooperative) objectives of the two organizations at the village and farm level. The two organizations will be viewed in national and historical perspective later. Suffice it to note here that the cooperatives provide one possible medium through which needed group decision-making can operate, such as acquisition of farm supplies, marketing and credit facilities, allocation of government cropping quotas and subsidies, and the organization of village improvements and social services. In all of these activities, the Peasant Union now has access to considerable influence in the decision-making process and is exerting its influence. However, membership in the cooperatives for other than land reform beneficiaries is as yet not compulsory. Apparently the larger, more affluent and at times more innovative farmers frequently choose not to belong to the cooperatives. Additional data should be gathered on this point. (For a partial analysis, see Havens's technical report.)



The above information on the farming system in the existing irrigated area in the mid-Euphrates is supplemented by the following specific data on two cooperatives in the area visited in the company of local Peasant Union representatives and in which conversations were held with cooperative leaders and several farmers. How typical these particular villages are is unknown, but presumably they represent leading cases from the viewpoint of union and cooperative leaders. The land farmed by the members of the first cooperative has as yet not been included in the projected old land irrigation system reorganization but should be so included in the near future. There are sixteen families in the cooperative, each of whom received 2.5 to 4.0 hectare shares of the 55 hectares which were requisitioned from the prior landlord in 1964. The elected head of the cooperative has 2.5 hectares. All had been sharefarmers on similar amounts and pieces of the total of the 135 hectares that was previously owned by the landlord. The latter, under his residual rights, retained 80 hectares of the land himself and continues to employ sharefarmers to crop it on much of the same basis as before. The cooperative owns two irrigation pumps and one tractor and reportedly has been accumulating the payments due the cooperative under the Land Reform Law from the beneficiaries of the reform for their share in the land distributed to them in a bank account for subsequent investment in farm improvements and machinery. The amount involved was not stated. The cooperative farmers do not live on their land but in nearby towns. They all plant about half each of their separately identified pieces of land in wheat or cotton with some sesame being planted after the wheat. They expect to be given a sugar beet allocation next year. Each receives a share in the harvest equal to the output from his own piece of land even though the ploughing and harvesting are done jointly. After the irrigation system is reorganized they understand that the landlord, whose land will be included in the reorganization, will be required also to join the cooperative.

The second cooperative visited and herein described is one of three that are associated with the 3,400 hectares of Middle-Euphrates land which has been reorganized and redistributed. The main and secondary irrigation canals (all concrete lined) and main drains, together with the land leveling and reallocation, were completed and officially dedicated in early December 1978. Most of the 350 farmers who have holdings ranging from 1 to 40 hectares in a 1,600-hectare section of the reorganized area live in an adjoining village which has a population of about 6,000. Many also belong to the cooperative visited and here described. The elected head of the cooperative, which reportedly has a total membership of 560, has 1.5 hectares. A 60-hectare holding is land still retained by the previous major landlord who had since allocated part of his residual share among other members of his family. One of the cooperative members present, who was eulogized as an especially hard-working and good farmer, had received 2 hectares in the land distribution and also continues to farm 4 hectares of his previous landlord's land as a sharefarmer. In addition, he manages another 3 hectares received by his elderly father under the land redistribution. The family of the son consists of his wife, three

pre-teenage children and himself. The cooperative head (or manager) is responsible for assigning the tractor use (two tractors) and fertilizer distribution with associated credit. He gets no extra pay as manager and is serving a four-year term.

The manner of handling the reorganization and redistribution of the land in this 1,600-hectare area is of special interest and is based on the direct testimony of about a dozen farmers present at the interview. The engineering work was done by a Rumanian firm. The work took two to three years to complete during which the farmers were provided with an indemnity payment based on the amount of land withheld from production, and most had wage employment on the project. Land not used for infrastructure (including land set aside as permanent village land) was reallocated to the previous farmers in shares proportional to their previous holdings. However, the reallocation was carried out in such a way as to give all farmers who were entitled to a share of under 3 hectares single pieces of land in a selected area, while all farmers entitled to a larger share were assigned three pieces of land each in a different block. The latter is designed to facilitate consolidated cropping in each of these blocks of the reallocated land area at the expense of some planned fragmentation of the individual holdings. (It was not determined whether the previous landlords' holdings were fragmented in the reallocation.)

No crops have been grown on the reorganized land yet, but the area is expected to be fully cropped next year. The GADEB retains responsibility for the control of water allocation from the primary and secondary canals. The farmers (and the cooperative) will be responsible for all water distribution and farming activities beginning from the concrete secondary canal outlets. On balance the farmers appeared to be very pleased with the project and the prospects of higher incomes from increasing cropping intensity (informed sources say from 100 to 110 percent beforehand to about 150 percent in the future) and from expected higher yields due to more reliable and regular water flow, better drainage and more effective use of machinery. They look forward to the development of improved storage facilities in the village. The whole project and the farmers' general attitude give a very favorable impression. However, what the actual cost/benefit ratio will be remains to be proved and what charges are to be levied on the farmers for full or partial cost recovery is as yet undecided. An initial proposal is a water charge of £400 per hectare per year on the reorganized land plus amortization of installation costs over a 40-year period. By comparison, a 1978 GADEB study in the Lower Euphrates Valley estimated that reorganization and reclamation would result in an increase in the gross value of output of about £640/hectare per year and an increase in the net value of output of about £506/hectare per year.

Since the Peasant Union is an important and continuing part of the superstructure with respect to the already cultivated lands it is relevant to note that the organization, which was founded in 1964, has its head office in Damascus, a provincial office in the



administrative center of each of the 6 Mohafazat and a local office in each of the 52 Mantikas.

Its membership to date has been open to agricultural wage workers, sharecroppers and owners who do not sublet land or employ permanent workers, with the last group constituting about two-thirds of the members. Village unions have increased from 1,823 in 1970 to 3,014 in 1974 and membership from 138,803 in 1970 to 220,600 in 1974 and approximately 267,265 in 1978.\* The union played an active role in the Land Reform program, having a member on each local land distribution committee. It has also played a role in the supervision of government production plans (crop area assignments) and in promoting such social/economic objectives as rural health facilities, farmer education and even in experimentation and production activities (it has, for example, recently established some sheep fattening cooperatives of its own, including one in Al-Rakka). Small though the sample may be, it is interesting to note that two union officials in the Al-Rakka office, who previously had been sharecroppers and were beneficiaries under the Land Reform Program, were now each farming 8 hectares and 10 hectares, respectively. In each case they had received rainfed land under the Land Reform Program which they had since at least partially converted to irrigated land by digging wells. In other words, they were now both successful and relatively substantial farmers by local standards.

### 5.5 The New Irrigation Land Areas

By way of the contrast to the land tenure and farming systems that are characteristic of the existing irrigated land, the following data are drawn from recent GADEB surveys on some of the areas of rainfed land, which is to be irrigated in the future. The East Maskanee Area has no currently irrigated land but with about 36,000 hectares of potentially irrigable land (excluding the Government Farm) now has a resident population of about 1,330 families living in 37 villages.\*\* Among these, 42 families own land in units averaging 47 hectares per family although 38 percent own less than 20 hectares. An additional 17,900 hectares is held by recipients of land under the Land Reform redistribution (464 hectares of Agrarian Reform Land and 17,435 of State Land--the actual number of recipients is unavailable). As a residual, therefore, apparently about 15,000 hectares in East Maskanee is in the public domain and unused

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\*This roughly corresponds with the total membership of farmers' cooperatives although the membership lists would not be identical. Countrywide there were, in 1976, 3,297 farmers' cooperatives with 236,269 members. The land farmed by cooperative members covered 42 percent of the irrigated land and 21 percent of the rainfed land, and cooperatives served 26 percent of the agricultural labor force.

\*\*That is an overall population density under one-third of that in the Middle Euphrates Valley.

except for sheep grazing. The Beir Al-Hashim part of the Balikh Basin, comprising 10,000 hectares, also has no currently irrigated land and there are only 16 resident families in the area. However, 238 families cultivate 7,918 hectares under rainfed conditions and of this total, 7,148 hectares is privately owned and 770 hectares is allocated State Land. Thirty percent of the owners own less than 10 hectares and 5,760 hectares (80 percent) of the private land is farmed by 180 of the 206 owners in amounts averaging 31 hectares. The remainder is rented to other farmers. Apparently, therefore, about 2,082 hectares in the area are still public domain used only for seasonal sheep grazing if at all. In the West Maskanee area with about 105,000 hectares of land projected for irrigation, there are about 1,873 families (and a total population of 10,575) residing in 46 villages.\* Only 114 hectares is already irrigated from wells by 59 recipients of Agrarian Reform Land and only 27,227 hectares is farmed under rainfed conditions. Of the latter, (a) 2,618 hectares is privately owned by 100 families (average holding, 26 hectares, with 24 percent of the holdings being under 10 hectares), (b) 6,385 hectares is Agrarian Reform Land, and (c) 18,224 hectares is distributed State Land. (The number of beneficiaries is unknown.) This would seem to leave approximately 78,000 hectares of public domain land used only for seasoned sheep grazing.\*\* Finally, by way of a further example of the lands slated for irrigation, Section II of the Balikh Basin which has an area of 26,000 hectares and borders the Pilot Project lands to the northeast has a resident population of 18,999 divided among 3,285 families and 21 villages. Nine thousand one hundred and sixteen hectares are currently irrigated and of this 7,460 hectares (82 percent) is privately owned and 93 percent of this, in turn, is farmed by its owners in units averaging 4.3 hectares and with 58 percent of the holdings being less than 3 hectares. In addition, 4,016 hectares (9.1 percent) of presently cultivated rainfed land is owned by 159 families who farm all but 247 hectares of it themselves. The remaining irrigated land (1,656 hectares) comprises 1,180 hectares of expropriated and redistributed private land and 476 hectares of State Land distributed under the Land Reform Program. The balance of the cultivated rainfed land (totaling 14,072 hectares) is almost entirely redistributed State Land. Figures on the numbers of recipients of redistributed land are not available.

Putting all these figures together it would appear that there is no unassigned public domain in this section of the Balikh Basin, and, surprisingly, the resident population density is not very different from that of the Middle Euphrates Plain.

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\*The resident population density in this area is thus only about 15 percent of that in the Middle Euphrates Basin.

\*\*Seasonal sheep grazing rights are usually based on kinship and segmented alliances that have largely been ignored by the State (see Monzardo report).



The Social Section of GADEB has assembled or is in process of gathering similar and additional data for other parts of the designated development area but the preceding preliminary data are sufficient to demonstrate the contrast between the projected new irrigation lands and the old irrigated lands on the river flats of the mid- and lower-Euphrates. In particular, the newly irrigated lands tend to be very sparsely settled and only marginally exploited in relatively large (by area) sized farms. But certain prior private rights do exist on some of the land in most of these areas and the productive value of these existing holdings stands to be multiplied many times over through their conversion from rainfed to irrigated conditions of farming. The existing irrigated lands mainly concentrated on the mid- and lower-Euphrates Plains are by contrast densely populated and essentially all assigned to individual farmers and mainly in private ownership. On the other hand, the increase in the value of this land as a result of the improvement of the irrigation systems will probably be relatively smaller although this is an assumption deserving of closer documentation.\*

In the context described, the government has been attracted to at least experiment with a large-scale, labor-saving and mechanized farming system of exploitation of the new land to be brought under irrigation. The vehicle of settlement to date is what might be called the "GADEB Farm." A total of 15 such farms that are already established on the 20,000-hectare Pilot Project, and also the large-scale dairy farm established at Al-Rakka, are especially interesting forms of farm management. They obviously deserve systematic and careful monitoring in order that final plans for the development of additional similar areas might fully and objectively benefit from this experience. The "GADEB Farms" so far established have certain common characteristics. The objective has been to establish essentially self-contained units, each with between 1,000 and 2,000 hectares of land and each fully equipped with large-scale modern farm machinery, and an irrigation and field system adapted to the needs of such large-scale farms. The organization of these farms will be easily adaptable to different forms of land use in accordance with changing national output requirements of different crops. All of the farms are to be provided with an administrative center including offices, machine shops and storage facilities, houses and garden plots for the workers, a civic center, health center and elementary school. The blueprint calls for the farm workers to be paid according to a work point system, annual bonuses and other recognitions and with benefits and working hours similar to that of city workers. Reflecting this new work place definition the farm workers were programmed to be members of the Workers Union

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\*An important unknown is the extent of holdings that involve combinations of land in the irrigated areas and in the rainfed areas. The relatively smaller return assumption is partly due to size of holding. If these holdings are exploited cooperatively with increased mechanization, return might be greater.

(along with city workers) rather than the Peasants Union (which would be individual farmer oriented). For details on the organization of work on these farms, see Havens's report.

One of the 15 GADEB Farms visited in the pilot area was found to have the following characteristics: the farm had been established in 1973 with 1,300 hectares of land; 950 hectares were being cropped mainly with wheat (40 percent), cotton (10 percent) and spring and autumn sugar (40 percent) but with maize as a secondary crop; 10 percent of the land was reported to be planted with poplars and fruit trees and an impressive poplar plantation was viewed. Yields of wheat to date were said to have varied from 2.2 to 4 tons per hectare and cotton from 1.75 to 4 tons per hectare. Cropping had been adjusted in the previous year by government request to accommodate a larger proportion of sugar (previously 30 percent with cotton 20 percent). The labor force consisted of (a) 110 permanent farm workers and their families (some of whom were employed as temporary or seasonal workers on the farm). Some of the permanent farm workers (about 20) had been farmers in the area before the GADEB Farm was established; some were farmers displaced from the storage area of the dam; and some came from other farming areas on the Euphrates. They were all being paid a uniform wage of £11.5 per day (except for orchard workers who received £16 per day). These wage rates were increased by 1 S.L. in 1979 and vary by age and sex. For details see Havens's report. The working day was 8 hours, with 6 working days per week and 14 days paid annual vacation. (b) A Technical Staff including the manager (an Agricultural Engineer), an Assistant Manager, five Block Managers (responsible for 250 hectares each), three specialists (in Forestry, Orchards and Plant Protection), fifteen Tractor Drivers and Mechanics and sixteen Water Distributors. The Block Managers were reported to all have twelve to fourteen years of schooling. (c) An Administrative Staff of six members (including an Administrative Assistant, Clerk, Personnel Officer, Cost Accountant, Storekeeper, and Dispatcher). The village, which had been especially constructed for the farm, contained a central office building, a grade school, a commune center and a machine shop. These were surrounded by 250 double (duplex) houses, constructed of concrete and designed to be used by either two small families or one large family (defined as a family with more than six members). Each duplex had two large rooms and one small kitchen on each side with outside bathroom facilities. About eighty of the permanent workers' families had over six members. There was thus a considerable surplus of houses (about thirty double units) over and above the needs of the 110 permanent workers, and these were assigned to temporary workers, staff members or used for storage. It was reported that a £7-per-month maintenance tax was charged for the houses, but that no rent was charged. Permanent farm workers had access to a private plot of 300 square meters in a field near the village, and they were free to keep a few sheep (one or two) which, apparently, several of them did. The GADEB Farm itself had no livestock. Field work on the farm was done under the supervision of foremen selected from among the permanent workers, with the foremen being responsible to the assistant managers.



The farm that was visited was, therefore, decidedly a going concern, and two other State farms viewed from the highway had a similar general appearance. However, insufficient verifiable information was obtained to warrant an estimate of the profitability of the farms or any conclusion as to the actual workers' reactions to them. (For workers' reactions, see Havens's report.) One point worthy of note is that a rough count of the labor resources involved on the visited farm indicated that there was probably one permanently employed person (and family) for every 5 to 6 cropped hectares, plus a sizable number of temporary (seasonal) workers. Also, an obvious problem was the apparent need for very small irrigation bays on the farm due to the fact that the land was not level. This clearly obviated many of the anticipated possibilities of effectively using large-scale machinery. Also, it deserves to be recorded that a Peasant Union official, when asked on a subsequent occasion whether or not he thought State farm workers preferred that arrangement to being independent farmers on say 4 hectares of land, said that under present conditions there was no doubt that they would prefer the latter, and also work harder for themselves than they did on the State farm.

It should be noted that the present organization and management of these farms do not fully correspond with what a "state" or "collective" farm might look like in other countries. They are not autonomous enterprises nor are they managed by an agricultural agency committed to maximize productivity. Worker rewards do not follow the more common prescriptions for a state farm. The Syrian farms are, in fact, operated as subunits of the GADEB and are best viewed as transitional land reclamation and settlement organizations. They could be turned more in the direction of full-fledged state farms more in the Soviet model or just as easily in the direction of individual farm units operating with the framework of some group action superstructure such as a cooperative. All that can be said with certainty is that many government officials and farmers do question the likely effectiveness of the State farm as the most appropriate vehicle for long-term productive exploitation of the new irrigated land along the Euphrates. Another issue concerns what is to happen to the farmers who were displaced from their lands by the development of the 15 GADEB Farms, and those who would be impacted by a similar development pattern in other areas. The ground rules apparently provide that they are to be paid an indemnity for disturbance and also paid for their land in cash or in kind (equivalent land in the vicinity), but what has or will yet be done is unclear. Since the numbers of the previous farmers in the Pilot Project area reportedly were small under the prevailing rainfed pattern of farming and since many did not live on the land but rather in nearby towns, the problem has not been as serious or conflictive as it might otherwise have been. However, the problem is one of at least local concern in some areas.

A further experimental farm structure of interest in the region is the Dairy Farm or "Station" established at Al-Rakka. This is not so much a "Pilot Project" as the GADEB Farms, since by 1975

there were already seven well-established such enterprises in Syria spread around six different provinces and with each averaging 450 dairy cows. The initial stock of 5,000 Fresians was earlier imported from East Germany. The Al-Rakka station was established in 1974 with a seed herd of 197. This has been expanded to 300 producing cows plus 430 other stock. The station is fully built with the capacity of handling 600 cows in production. It also has 315 hectares of land associated with it, 50 hectares of which are being cropped in alfalfa, sorghum and barley. However, most of the feed is brought in from elsewhere.

The farm has ninety workers (sixty for the dairy and thirty for the farm crops). There are six milkers (paid £400 per month each) and two veterinarians. The manager is an agricultural college graduate. The cows are machine milked and the milk is sold locally by can delivery for £1.05 per kilogram. The station is equipped for artificial insemination but also maintains two bulls. The cows were stated to be worth £4,000 each but some are being sold to farmers for £2,500 as an incentive to encourage more farmers to keep cows. The cows reportedly average 3.5 tons of milk per year (or 12 kilograms per day), with top producers giving 30 kilograms per day.

The livestock were generally in good condition. The facilities also appeared to be well maintained. The manager, who appeared to be very competent and to have a good staff, reported that the primary initial problem was lack of an adequate feed supply. The prospect of being able to effectively staff and manage the enterprise when it reaches full capacity was also a matter of concern to him. He volunteered the opinion that at the present time the project is heavily subsidized but was confident that it can break even at full capacity. Also, if all the available land can be brought under fodder crops with the aid of a sprinkler system (the land not being level), he felt that it could be essentially self-supporting. A new sugar beet factory across the highway from the farm is an obvious future source of the farm's feed requirements.

#### 5.6 Some Tentative Conclusions and Suggestions

The foregoing merely scratches the surface of the topic addressed. It does, however, serve to reinforce the view that the human and organizational aspects of the agricultural sector assessment project are of considerable importance. Equally significant is the fact that while this is by its nature a sensitive area of analysis in any country, its importance seems to be widely recognized by Syrian officials; and, in spite of the existence of several strongly held preconceptions, there is considerable questioning of many existing policies and practices. A frequently voiced opinion is that many basic policy directions with respect to the organization of agricultural production, and especially in the principal new settlement areas, are not finally determined. Among the more significant preconceptions being discussed are (a) a widespread belief that government supervision, if not direct government



enterprise, is a necessary means to the elimination of exploitation and inequality and the effective implementation of development plans, (b) a largely unquestioned belief in the relative efficiency of large-scale, mechanized farming, (c) a related reliance on state farms as an essential component of a truly socialistic economy, and (d) the notion that subsidies for favored forms of economic activities are either costless or can be, and appropriately should be, passed on to others to bear.

In reality, while the prior extreme concentration of wealth and power in the hands of large landlords has been substantially dissipated, the basic mode of agricultural production in Syria remains individual peasant, or family farming; State-managed farms are still few in number, and only about 25 percent of the cultivated land is encompassed by the administrative apparatus of Agrarian Reform cooperatives. Most land is still held in private ownership in the traditional Syrian sense, and with a considerable range of farm sizes and mixture of forms of tenure of land held by given farmers. As such, modern Syria provides an especially fertile ground for comparative analysis of the relative efficiency of different forms of farm organization and tenure and this deserves high priority in future planning studies. It is suggested that special attention be given to a comparative analysis of the record of State farm settlement of new irrigated land and that of rainfed land that has been converted to irrigated agriculture by private farmers over the last few years by means of wells. It will be helpful, too, if specific effort is made to identify the current optimum size, land tenure and equipment needs of progressive family farmers in irrigated areas. It might be anticipated that the size of such farms will likely fall in the range of 6 to 12 hectares, and very often involve a mixture of privately owned and rented land. Also, it may be the case that this subgroup of the Syrian farm economy is relatively efficient, and that under certain conditions could prove to be an effective spearhead for future agricultural sector development in most parts of the country. However, close attention to labor arrangements on these farms and the pricing system for products is necessary if the goals of income redistribution and equity are to be met.

It deserves to be emphasized that even without a multiplication of State farms, there will be a continuing need for improved and expanded mechanisms for group decision-making among farmers in Syria outside the State farm sector. Questions such as compatible land use and cropping patterns, effective management of irrigation and drainage, improved marketing and farm supply facilities, sharing of certain machinery, access to credit, and village improvement programs all require a measure of cooperative activity on the part of different farmers in given areas. The relative effectiveness of the several types of cooperative arrangements now existing in Syria deserves special study. Particularly important is the need to distinguish appropriate functions of local government from those of village cooperatives and of provincial and central government agencies, as well as farm support functions that would be more efficiently organized through specialized regional service cooperatives

than through general village cooperatives. It is critical to explore the degree to which cooperatives are to serve as instruments of government policy implementation in contrast to self-interest group decision-making on the part of member farmers. It is hypothesized that the existing, often inadequate, mechanisms for group decision-making suffer additionally from considerable jurisdictional overlapping and uncertainties as to the basic intentions of the central government. It will also likely be found that central agencies suffer from considerable duplication of efforts and/or inadequate cooperation, and that there is a general tendency for government efforts to overly reduce the autonomy of the production decision-making process of farmers and local cooperatives. Centralized agencies also have tended to pay inadequate attention to the task of infrastructure development which is largely beyond the scope of the farmer and local community, but which substantially determines the horizons of opportunity and decision-making that are open to the farmer. In particular, adequate research and extension services, farm credit facilities and access to markets deserve special consideration.

There are a number of fundamental realities that influence and channel agricultural development planning in Syria. One of these is the chronic deficit that the country has experienced in its balance of payments over the past several decades and the fact that certain agricultural imports to a degree contribute to this problem. Particularly important in this regard are sugar, dairy products and tobacco, which together tend to account for half or more of the overall deficit. One result has been a heavy emphasis on import substitution in agricultural development planning. In this regard the recent construction of three major sugar beet factories with a combined processing capacity of 1.3 million tons per year and the establishment of the several large dairy farm stations are cases in point.

It would be instructive to analyze whether Syria has a sufficient comparative advantage in the production of sugar and milk. However, this analysis has to recognize that importation of sugar and milk represents a major drain on the country's foreign exchange. There are economic reasons to question a shift in the use of land from cotton to sugar beets, or a shift in the livestock industry toward cattle rather than sheep. But these economic questions have to be balanced against the problems and costs of being dependent on the importation of such critical commodities. These comments are made to suggest that there is a need to focus attention on the identification of where Syria has its main comparative advantages in the agricultural sector and what the trade implications of these advantages might be. This analysis in turn would have significant implications with regard to appropriate forms of land tenure and farm organization and of the agri-business dimension of the agricultural sector.

Another fundamental reality is the high proportion of the land in Syria that is committed to rainfed crops and is therefore highly vulnerable to seasonal variations in rainfall. In recent decades,



poor crop years and other factors, including the breakdown of the tribal system of land use control, have tended to result in considerable overgrazing and soil depletion in the dry areas. It would appear obvious that no agricultural development program in Syria will be sound that does not recognize the need to maintain and reinforce a symbiotic relationship between rainfed (and irrigated) agriculture and a continuing livestock economy. The question of how to incorporate an adequate livestock feed component in the rotation patterns established in newly irrigated lands is one of the critical questions. Also, how crop production and animal production are to be integrated in Syria both on individual farms and among farming regions will prove to be extremely important. (For more details on the interrelationship of farming systems, see Haven's and Manzardo's reports.)

Based on the experience of other countries, including some in the Middle East, it is suggested that it is advisable to proceed with considerable caution with large-scale development of new irrigated land in contrast to efforts to improve production on established farms through a combination of improved irrigation and drainage systems and improving crop varieties and cultural practices. There are many unknowns about the potential of the identified new lands for irrigated development both of a physical nature (such as questions of soil structure, land leveling needs, etc.) and of a socio-organizational nature (such as the planning of new villages and the attraction of new settlers). Some observers have argued that it is desirable to reorient priorities, especially in the Euphrates Valley, more in the direction of old land improvement and the development of rainfed land proximate to it, at the expense of some of the high-cost developments in more remote and essentially unpopulated areas of new land. The former might benefit from significant complementarities between existing and new irrigation areas and a greater reliance on existing human resources, skills and proven land resources. This policy question should be further studied, however, since some new lands might be easier to organize and more readily controlled to avoid the buildup of gypsum and salts in the soil.

Needless to say, the future development of farming in the Euphrates Valley and elsewhere in Syria depends considerably on improvements in education of the farm sector labor force all the way from the individual farmer to the specialists in supporting institutions and government. A major weakness in the present system would appear to be insufficient resources devoted to research in both agronomic and socioeconomic directions plus insufficient resources devoted to extension services. There would appear to be a good supply of graduates in agricultural science from Syrian universities but inadequate mechanisms to bring their training to bear on the needs of agriculture on the farm level. (For details, see Information Assessment and Havens's report.) It is suggested that the training and research efforts of the GADEB organization need to be considerably and rapidly expanded and that the country would benefit from a rapid upgrading of selected graduates in such areas as survey research techniques and the management of agricultural infrastructure organization.





CHAPTER VI

RURAL SOCIAL SERVICES

By

Harold Lemel

TABLE OF CONTENTS

	<u>Page</u>
1. The Delivery of Social Services in Rural Syria	1
Social Services in Rural Development	1
Special Problems Affecting Social Service Delivery	3
2. Education and Health Delivery	10
The Structure of Social Service Delivery	10
Growth and Distribution of Education and Health Services	15
3. Social Service Delivery Through the Rural Development Centers	50
Structure of the RDC's	51
The Problem of Locating Centers	61
The Impact of Scheduling and Program Appropriateness on Access to and Utilization of Services	69
Overall Assessment of RDCs Role in Service Delivery	77
Conclusions	81
4. Towards a More Locally Adjusted Planning Process	83
Appendix 1	86
Appendix 2	87
Sources	88



## 1. The Delivery of Social Services in Rural Syria

### 1.1 Social Services in Rural Development

Since independence, and particularly after 1963, the Syrian government has actively sought to spread social services and amenities to its rural citizens. This goal is repeated in each of the four Five Year Plans and in the Fourth is expressed as follows:

. . . to reduce the differences between Mohafazat and between the city and the countryside within the same Mohafaza in the economic and social standing of citizens.

Along with concern for equity, dispersion of basic services is considered essential for achieving several broad policy aims. These merge into a general desire to avoid the type of polarized development so common in most developing countries--the overwhelming concentration of industry and services in one or two urban centers while stagnation and out-migration come to characterize the rest of the country. At its presently high levels, such migration is thought to be dysfunctional; it depletes the agricultural labor force of its most productive members and thus aggravates further what is already considered to be a serious agricultural labor shortage in several areas of the country.

In addition to concern over migration, support for policies to raise the skill, health and nutrition levels of the rural population and to more equitably distribute productive factors--mainly land--comes from the conviction that measures such as these enhance productivity. Accordingly, major Syrian rural development efforts--the agrarian reform and the Ghab and Euphrates River Basin Development Projects--combine either land redistribution and/or physical resettlement activities with the promotion of health, education, literacy and rural industry and handicraft programs.

Yet even if such comprehensively conceived measures could increase productivity and slow down rural-to-urban migration, problems with production will persist (see Havens) and migration from the countryside is likely to continue at a rather high level (see Williams). The rate of rural population growth can be expected to remain high while at the same time cultivation of the land has been extended to its limits in most areas of the country, except where irrigation possibilities have yet to be developed. Even where land redistribution has occurred, breakup of medium and small holdings through inheritance over one or two generations threatens to reduce them to a size no longer large enough to support holders and their families. Many facing this grim prospect are consequently being forced to seek nonagricultural sources of livelihood.

Many planners, both in Syria and elsewhere, advocate rural industrialization as one way to address this problem. According to a statement by the World Bank (1975), rural industry could:

. . . provide employment, increase incomes, slow rural-urban migration, increase the supply of goods and services

to farmers at lower cost and generally stimulate further rural and regional development.

But resort to this or other employment promotion measures presumes that people have needed skills, or can acquire them. These needs add urgency to the provision of formal schooling and nonformal training for rural residents.

Nonformal sources of skills include the intergenerational transfer of know-how from father to son, apprenticeship and on-the-job training. Such training modes are relatively unstructured, the trainee remains close to the working situation, and State regulation and sanctions are limited or nonexistent.\* Formal training is largely confined to schooling, basically a Government sponsored or controlled activity generally but not necessarily separated from the world of work, and one that is highly structured.

Whether the skills obtained nonformally or formally can be translated into a source of income and livelihood depends both on the access to means of production--land, tools, machinery, even an office--as well as on the recognition of skills as desirable by potential employers and clients. Such recognition can be informally granted through reputation within the community, in which case the sale of skills and mobility may be limited to that community. Recognition of skills can also be State encouraged through licensing or certification, which is the procedure used in the public school systems to certify certain skills on a national basis. While certification is now basically limited to formal school graduates and those completing Government training programs, it could conceivably be introduced to cover those obtaining skills from other sources.\*\*

Skill acquisition whether from formal or nonformal sources is particularly vital for those in rural areas whose family-based agricultural income is insufficient either to support them in farming or to permit entry into self-employment through financing a business of one kind or another. As a channel into private or State sector employment, where this kind of initial capital accumulation is unnecessary, formal education opens up job opportunities for those who might otherwise have no other option but to work as casual laborers or in petty services.

This problem is especially relevant for females who are socially more restricted than males in being able to attain self-employed status. They tend to cluster in the unpaid family labor and employee categories, which together accounted in 1970 for 76 percent of the female labor force. Opportunities for women, if they have

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\*This last feature is subject to change as the State intervenes with training outside the schools and imposes regulations and grants recognition through licenses or certificates to trainers and trainees.

\*\*Traditional village midwives, for example.



the educational credentials, are relatively great in professional and technical occupations, within which they made up 30 percent of the total labor force in 1970. Another indication that formal education is important and becoming increasingly so for females is the fact that almost three times the proportion of working females have secondary education or higher than do their male counterparts (see Table 1).

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TABLE 1: PROPORTION OF LABOR FORCE WITH SECONDARY OR POST-SECONDARY EDUCATION, BY SEX, 1970 AND 1976

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Sex	1970	1976
Male	5.4	10.3
Female	9.5	27.2

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SOURCE: Prepared from Statistical Abstract (1978).

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As shown in Figure 1, female labor participation rates rise sharply for educated women, especially those with vocational or post-secondary certificates. It should be kept in mind, however, that because female labor participation is undercounted in unskilled work (particularly in agriculture where formal educational levels are low) the above figures probably overstate the actual proportion of working women with educational credentials.

For these reasons and to meet the growing demand for skilled manpower nationally, it is critical to identify barriers to educational access and to develop policies to minimize or eliminate them, especially for residents of rural areas and females.\* Such access barriers must also be reduced for other essential services, particularly health. As stated in a World Bank report, "one of the most important elements reinforcing rural poverty is that those most needing medical or health care are precisely those who are too poor or too remote from any facility to obtain it" (World Bank, Rural Development Sector Policy Statement, 1975, p. 26).

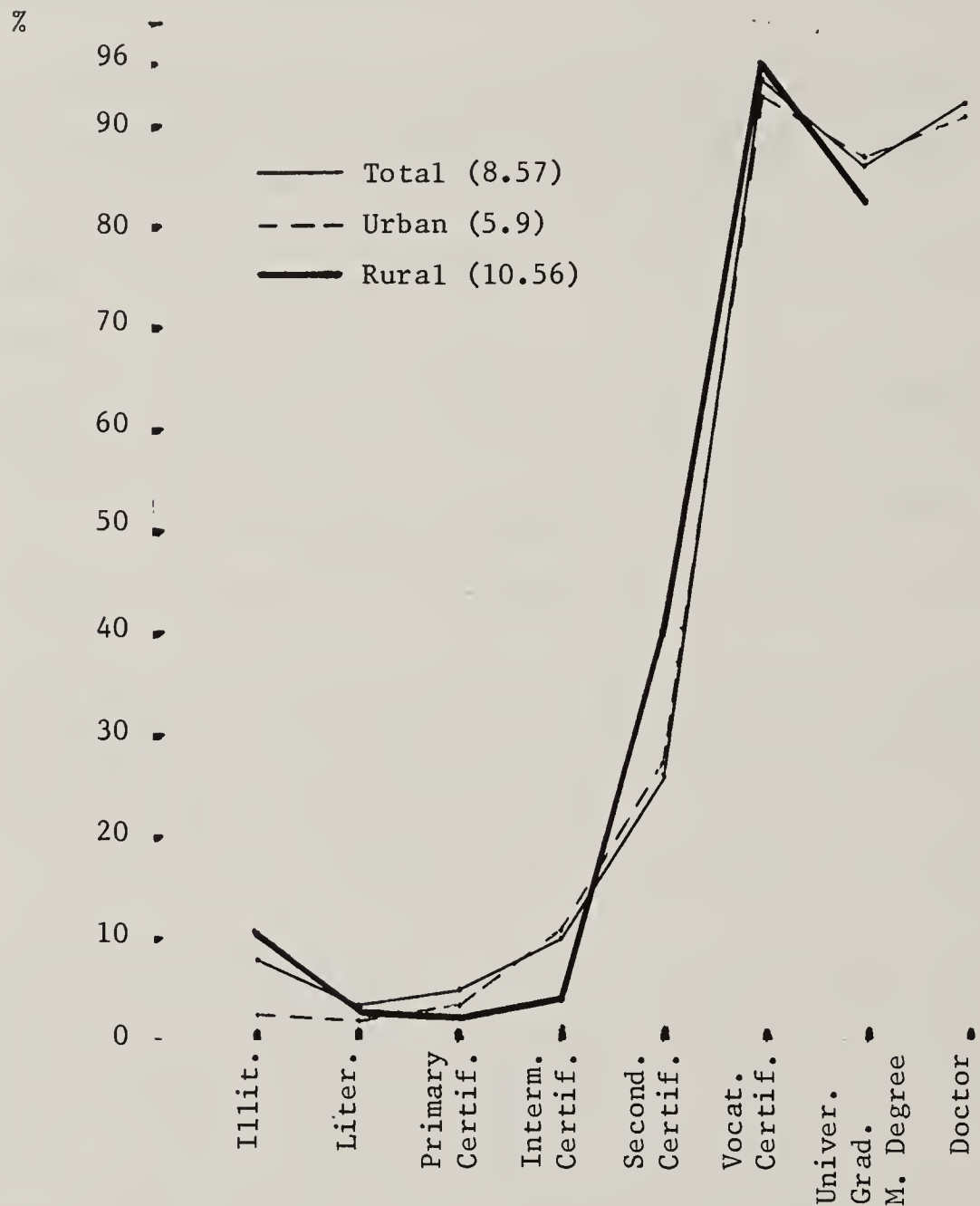
## 1.2 Special Problems Affecting Social Service Delivery

1.2.1 Unique Features of Social Services: Although the delivery of social and physical services faces some common problems, greater

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\*The Fourth Five Year Plan places special emphasis on the need "to attract women to productive work and increase their participation in manpower and pave the way for her to acquire the necessary abilities."

FIGURE 1: SYRIA 1970--FEMALE PARTICIPATION RATES (age 30 and over) ACCORDING TO LEVEL OF SCHOOLING



SOURCE: ILO, Manpower and Employment in Arab Countries: Some Critical Issues (Geneva: ILO, 1978), p. 58.

difficulties are often encountered in planning for the delivery of social services as compared to physical ones. Because of their high infrastructural costs and regional complexity, programs to provide potable water, electricity or roads are usually Government initiated and financed and are highly visible;\* moreover, they require only a relatively passive stance by beneficiaries. Other physical service delivery, of agricultural production inputs, for example, is typically broken down into units deliverable to sub-groups of the population such as farmers and is provided by commercially oriented agencies, such as the Agricultural Cooperative Bank, cooperatives or private companies.

Social services, health and education in particular, lack these features. A school or health clinic is usually not an impressive engineering achievement. Each facility has to be designed, nonetheless, to serve the entire population in a given area and not particular clients. Moreover, utilization of such services relies to a certain extent on client initiative in response to felt needs and capabilities. The schools and clinics are, at the same time, viewed by the State as of fundamental importance to the development of human resources and are for this reason subsidized and not commercially run. The problems of social service delivery for the State combine with widely varying patterns of human settlement--some highly centralized, others widely scattered--to produce special challenges for the design of such systems.

1.2.2 Fragmentation of Settlement: Among the factors that can limit service utilization, the problems of physical access are the most obvious ones, including the distance a person has to travel to get the service as well as the quality and costs of transportation (both direct and indirect). Eliminating or even minimizing these barriers to access throughout the country is problematic given the existence of 6,308 villages and an even greater number of sub-village units or mezr'aa, some 7,700.

As displayed in Table 2, fragmentation of settlement is especially severe in certain areas of the country, particularly in those characterized by arid or semi-arid conditions (for example, Al-Rakka and Deir-ez-zor). In Al-Hasakeh, even though the ratio of mezr'aa to villages is small, the number of mezr'aa is very large. Even greater difficulties are encountered in trying to extend services to semi or completely nomadic Bedouin groups in the steppe (see Manzardo).

Some efforts have been made to alter existing settlement patterns by encouraging relocation of people from small to larger

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\* See Appendix 2.

TABLE 2: DISTRIBUTION OF VILLAGES AND MEZR'AA BY MOHAFAZAT, 1977

Mohafazat	Mezr'aa	Villages	No. of Mezr'aa per Village
Damascus City	--	--	--
Damascus	298	195	1.53
Aleppo	1,381	1,415	0.98
Homs	504	425	1.19
Hama	600	484	1.24
Lattakia	859	447	1.92
Deir-ez-zor	261	128	2.04
Idleb	475	405	1.17
Al-Hasakeh	1,682	1,637	1.03
Al-Rakka	988	251	3.94
Sweida	47	124	0.38
Dar'a	68	121	0.56
Tartous	372	512	0.73
Quneitra	<u>147</u>	<u>163</u>	<u>0.90</u>
TOTAL	7,682	6,308	1.22

SOURCE: Statistical Abstract (1978), p. 57.



rural settlements. Such relocation is being attempted in some of the reclaimed areas of the Euphrates River Basin.\* A combination of positive and negative inducements (denial of services, restriction of pasture lands, etc.) has also been used to encourage Bedouin sedentarization (UNESCO:36). But on a nationwide basis, such relocation initiatives can only be expected to have a limited short-run impact on the problems of reducing access difficulties deriving from fragmented settlement patterns.

1.2.3 Pyramidal Nature of Education and Health Systems and Service Facility Location: Any effort to devise service facility location strategies for health and education is further complicated by the hierarchical organization of both the health and the educational systems in Syria; units are differentiated by capacity, type and sophistication of services provided, forming a pyramid, with fewer of the large, sophisticated facilities set on a base of many more numerous but more limited primary service units. While dictated in part by resource limitations, this structure is justified in the case of health by the assumption that at any given time relatively few people will require and seek expensive and sophisticated care. In education, limits in the need for certain highly skilled manpower categories underlie the structure.

Success of the system is gauged by the efficacy with which people are screened upward through successive levels. In health this means matching people who vary in the severity of their medical needs with appropriate service levels; in education there are the competing aims of selecting people by ability to fill needed manpower slots and the equity-inspired objective of opening access to the maximum number of people to levels at which skills or school certificates become marketable. For access to be meaningful, therefore, people with defined characteristics must be able to make use of several levels of the service hierarchy.

Location strategies must consequently determine optimal placement of facilities at each level as well as how to situate units so that they form complete service hierarchies within given areas, thereby providing the full range of services to any given population. On this issue there are two broad possible approaches:

- 1) The linkage of succeeding service system levels to corresponding levels of the administrative hierarchy-- Nahia, Mantika, Mohafaza. Decisions would still have to be made though on whether to limit Nahia centers to middle-level facilities (middle schools, for example) or whether it would be more appropriate to build secondary school facilities at this level, at the Mantika level or only within the Mohafaza center.

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\*GADEB officials hope that as more land is reclaimed and brought under irrigation, people will leave small villages typical of dry areas and resettle in new ones supplied with electricity, schools, etc.

- 2) Also possible would be the definition of regions within which to build complete service hierarchies, without reference to administrative level divisions. The Euphrates project is an example of this approach.

Whichever one of these alternatives is selected, a trade-off exists between the efficiency of locating facilities in the more populated centers and the difficulties posed for access to services for those living outside these centers. Since successive levels of administrative authority are roughly parallel to relative population sizes, many countries (including Syria) opt for a delivery system in which the more elaborately staffed and equipped permanent facilities are located in the higher level administrative centers, such as Mantika and Mohafaza centers. Smaller permanent facilities are placed in smaller sized settlements--Nahia centers or other villages.

Once a minimal physical or organizational presence has been established, service capacity can be extended in several ways. Mobile units may be set up to operate out of the main centers. Another alternative is to use existing infrastructure of buildings and personnel for a variety of purposes: for example, the use of primary schools and school teachers in adult literacy and in education, health and nutritional programs. Village cooperatives also provide a structural channel for the delivery of certain social services.

A further possibility which can be resorted to in combination with a delivery system either linked to the administrative hierarchy or one explicitly regional in orientation is to apply the central village concept. Villages with populations relatively large those in the surrounding area and centrally located in terms of road links to larger towns and administrative centers as focal points for the concentration of schools, medical facilities and rural industrial investment. Behind this strategy are the dual goals of first avoiding the ineffectual dispersion of investment, and second, to act as a brake on rural-urban migration by providing adequate services and job opportunities within the rural areas themselves. By locating middle or secondary level school facilities in such centers, access to education for villagers within commuting distance is enhanced since area families are no longer forced to relocate to town on a permanent or semi-permanent basis.

In Syria such a central village policy has been applied, though with the exception of areas under the GADEB's authority it has taken shape in an often uncoordinated and unsystematic way. A population size criterion of over 500 has generally been used to determine priority for the allocation of electric services, schools,

etc.\* In the reclaimed areas of the Euphrates basin, to date three of the 15 planned communities established by GADEB occupy positions as central villages. Each serves 4 surrounding villages located no more than 7-8 km. away and each possesses social and cultural centers, clinics, literacy courses and middle schools. The pinnacle of the health service hierarchy in the area remains in the Mohafaza center of Rakka, where a hospital is located to meet the needs of seriously or chronically ill patients for whom the smaller clinics are inadequate. By 1982 plans for the Euphrates basin envision the establishment of 39 central villages and 121 branch villages with a total of 46,943 resident families (U.N. Studies on Development Problems of Western Asia, 1975, New York, 1977, p. 32). While considered to be appropriate where villages are of small to medium size, one GADEB official argued that because of the generally large populations of villages in the Mid-Euphrates there was no need to apply the whole strategy but simply to install high-level facilities such as secondary schools and hospitals in a few larger settlements.

As attractive as this central village concept may be theoretically, such centers inside and outside Syria have frequently failed to develop into viable attractive service delivery centers. Already rapidly expanding district or traditional market centers with good transportation links often overshadow the smaller artificially created centers. Also, a problem has been the inability of such centers to support a differentiated occupational and service structure in any way comparable to those in larger towns.

Syria's six Rural Development Centers represent a variant of this central village approach, the main idea being to concentrate essential services in one location to meet the needs of between 40-50,000 people in the surrounding area. These multi-service centers which provide agricultural extension, health care, literacy and rural industries are examined in detail in Section 3 of this report.

Preceding this case study, a more general picture of health and education services in the SAR is provided in the following Section 2. That section portrays the present distribution of health and educational facilities and personnel and suggests what this distribution implies for access in different areas of the country. In addition to published and unpublished statistical sources, data from the 1979 Agricultural Sector Assessment Village Survey (henceforth to be referred to as the "Village Survey") are drawn upon.

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\*A lower limit is applied by the Fourth Five Year Plan for drinking water provision: pure water is to be made available to ". . . all villages with a population of not less than 150 in the Mohafazat of Deir-ez-zor, Al-Rakka and Al-Hasakeh and 200 in other Mohafazat" (p. 47).



The Village Survey is based on a national sample of 103 villages\* chosen to represent the range of agro-ecological conditions prevailing in Syria.

## 2. Education and Health Delivery

### 2.1 The Structure of Social Service Delivery

The most striking feature of social service delivery in Syria is the multiplicity of governmental and semi-governmental bodies and popular organizations involved. Responsibility for providing any given service is divided sometimes by function, sometimes by clientele, and most often by a combination of both.

2.1.1 Formal Education: Ministries responsible for formal education include the Ministries of Education, Higher Education, Industry, Agriculture and Commerce. The Ministry of Education administers the primary, middle and high schools; other ministries provide the secondary level agricultural, vocational-technical and commercial schools. Post-secondary technical education provided by the two-year "Intermediate Institutes" is divided among several ministries. For example, the Ministry of the Euphrates Dam administers the Intermediate Institute of Land Reclamation in Rakka. Syria's three universities (and soon a fourth) are administered through the Ministry of Higher Education.

2.1.2 Adult and Literacy Education: Responsibility for adult education, training and literacy is dispersed to an even greater extent. In the campaign against illiteracy, extra-ministerial organizations like the Labor and Peasant's Unions and the Women's Federation are extensively involved. In 1977, the Peasant's Union alone conducted 682 literacy classes with 11,675 participants (Bakour:46). The Ministry of Labor and Social Affairs also conducts literacy classes in villages served by its six Rural Development Centers. In addition, large-scale rural development schemes --most notably those in the Ghab area and in the Euphrates basin-- also contain literacy and training components. Thirty-seven courses with 780 participants were provided by the General Administration for Development of the Euphrates Basin (GADEB) in 1977.

For the most part, such literacy courses are held in village schools and are run by village school teachers administratively tied to the Ministry of Education. In the case of GADEB, those hired are either already specially trained staff or GADEB staff sent to undergo a Ministry of Culture training course in Damascus.

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\*The size of villages varied considerably: 13 percent had fewer than 200 registered residents; 12 percent, between 200 and 400 residents; 9 percent, between 400 and 600; 13 percent, between 600 and 800; 16 percent, between 800 and 1,400; 15 percent, between 1,400 and 2,000; 16 percent, between 2,000 and 4,000; 6 percent, more than 4,000.



Sometimes, the heads of social and cultural centers conduct the courses and are paid by GADEB for overtime. The Peasants', Labor and Women's Unions encourage members to participate in such courses.

In 1972, a framework for coordinating these disparate activities was established--the Higher Council for the Eradication of Illiteracy (Law 7, 1973). It is headed by the Prime Minister who is joined by the Ministers of Culture, Education, Higher Education, Finance, Planning, Agriculture, Local Administration and Defense and leaders of popular organizations such as the Peasants' Union.

2.1.3 Nonformal Skill Acquisition and Training: Almost by definition (see p. 2), nonformal skill acquisition lies outside the sphere of official government activity. Its importance is undiminished by this fact, however.

One of the impressive achievements in Syria over the last three decades or so is the degree of nonformal skill development that has occurred without state investments. With agriculture rapidly mechanizing (see Table 3), with producers and markets brought into increasingly close contact through an evermore elaborate system of roads and proliferation of vehicles (see Table 4) and with the growth in the number and size of towns, there has been an explosive demand for people possessing a wide variety of mechanical and artisan skills: welders, auto, truck and tractor repair, lathe operators, home appliance manufacturers and carpenters.

The response is evident even on the basis of casual observation in Syria's large towns and medium-sized Mantika centers. In these towns, there is a multitude of small industrial workshops in which it can be assumed that the majority of craftsmen are the products of nonformal training.\*

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TABLE 3: GROWTH IN AGRICULTURAL MECHANIZATION, 1971-1977

Machines	1971	1977	% Increase 1971-1977
Tractors	9,606	20,672	115
Water pumps	20,437	40,650	98
Combines, harvesters, threshers	1,368	2,254	65

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SOURCE: Statistical Abstract (1978)

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\*Government-sponsored training in mechanical skills has also been impressive, largely through the Ministry of Industry training centers. However, skill acquisition outside of these institutes has undoubtedly been significant.

TABLE 4: GROWTH IN NUMBER OF TRANSPORT VEHICLES, 1948-1977

Vehicles	1948	1963	1977	% Increase 1948-1977
Autos	10,981	22,717	177,215	1,513
Buses	1,238	1,849	6,829	452
Pickups	0	1,474	34,523	--
Trucks	4,283	10,688	31,522	636

SOURCE: Statistical Abstract (1978)

Several Mantika centers in the Homs, Idleb and Aleppo areas have grown at a remarkable rate. For example, Ifreen in Aleppo has doubled in population to become a town of 25,000 within the last five years; such growth was preceded and accompanied by rapid agricultural mechanization in the area. In this and other towns numerous tractor and machine repair shops have sprung up to service the agricultural hinterland. For villagers wishing to provide sons with skills, nonformal training opportunities in Mantika or Nahia centers have the advantage of being relatively close to home villages.

According to 1977 figures there were 39,807 private manufacturing enterprises in Syria, 82 percent of them with less than three workers and 39 percent being single-worker establishments (Statistical Abstract, 1978, pp. 690-91). Most of the shops which can be observed in villages and cities have at least one or two youths at work while apparently learning the trades of their employers, or masters if involved in an apprenticeship arrangement. The scope of apprenticeship is probably undercounted at 3,474 in 1977 (Statistical Abstract, 1978, p. 313) due to the qualification "unpaid" used in describing this category. Many of those who are in effect learning skills are young wage earners or recipients of pay in-kind.\*

The size of this informal training sector in manufacturing alone justifies a greater level of government attention and encouragement than has been given thus far. As argued by the author of an ILO study on Syria:

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\*"The traditional small-scale firms in the private sector are relatively more labor intensive (than large public and private ones) and make a noticeable contribution to the generation of skills through informal training . . ." (U.N. Studies on Development Problems in Countries of Western Asia, 1975, New York, 1977, p. 32).

. . . an appropriate balance will have to be found between government-sponsored institutions and private apprenticeship or in-plant training and up-grading programs (ILO, Manpower and Employment in Arab Countries, p. 11).

While not explicitly a call for greater attention to nonformal training, the following aim enunciated in the Fourth Five Year Plan can be interpreted as a mandate to move in this direction:\*

To widen the spectrum of training places of various levels to enable them to satisfy the needs of development of qualified manpower and in particular such needs as are required in connection with the application of modern technology and its needs in new specialties (Fourth Plan, p. 261).

Possible areas of state action to further these aims with regard to small manufacturers might be to:

- 1) facilitate cooperative organization of producers and expand training programs as complements to their credit, input provision, quality control and marketing functions;
- 2) establish linkages between vocational technical schools and artisan manufacture and service establishments through the provision of night courses;
- 3) provide technical and management extension services, similar to those in agriculture, either through the cooperatives or through formal vocational schools;
- 4) facilitate certification through examination of practical skills to permit greater mobility for those trained nonformally, and provide a basis upon which credit for the establishment of businesses might be granted to qualified individuals.

As the public industrial sector expands, increasing attention will also have to be paid to on-the-job training.

2.1.4 Health: While the Ministry of Health carries the main responsibility for providing health services to rural areas through its Directorate of Rural Health, a host of other ministries and agencies is also significantly involved. A 1976 study of Health Manpower and Services in Syria came to the conclusion that:

There is little evidence of an overall government strategy to guide the magnitude of public and private investments to extend health services . . . . [A multiplicity

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\*The SAR has, according to one observer, begun ". . . to recognize the role of small-scale establishments in providing employment, informal training and potential recruits for the modern sector . . ." (U.N. Studies on Development Problems, p. 38).



of public and private financing mechanisms is] combined with a large number of ministries and quasi-governmental agencies . . . engaged in and providing services (FHC, p. 15).

The Ministry of Labor and Social Affairs was, according to the same report, acquiring:

. . . a de facto role in national health policy formation, being involved in the construction of two hospitals--one in Damascus, the other in Aleppo as well as providing out-patient services at Ministry Offices.

The Ministry of Education has also been active in extending nutrition and health services to school children, particularly those in rural areas. Last year a supplementary school nutrition program was initiated on a limited basis to nine villages in Duma, Damascus, and will be extended in stages to cover all Mohafazat and 200,000 children by 1985. Daily rations of condensed milk (78 grams) and peanuts (50 grams) are provided to each child, a mix adopted from a similar program in Saudi Arabia. Teachers accompany distribution of the food with short talks on aspects of health and nutrition. Participating international organizations include UNICEF, FAO and WHO. The Ministry of Education and the State Planning Commission are charged with execution and planning, while the Ministry of Internal and Local Affairs determines where to set up these programs.

There is also a proposed program to build 50 school dispensaries by 1980 all over the country, with a target of 1 dispensary per 5,000 students. Each is to have a doctor, a medical assistant and a dentist for every 2 dispensaries.

The Ministry of Higher Education administers university-affiliated hospitals. One already exists at the University of Aleppo and another, a 640-bed facility, is being erected at the University of Damascus (Fourth Five Year Plan, p. 103).

As a response to the confusion and duplication created by the large number of authorities typically involved in the provision of health, education and other services, a series of inter-ministerial coordinating committees has been established--the Higher Council for Agriculture, Health, Planning and for the Eradication of Illiteracy, among others.\* Also noteworthy has been the ever-increasing

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\*Establishment of such a higher council is now being considered in the Euphrates area to coordinate the activities of the Ministry of the Dam with those of other ministries--Health, Education, Local Administration. It would be headed by the Minister of the Dam. The "Supreme Public Health Council, headed by the Secretary General of the Ministry of Health, is an advisory group of Syrian leaders which meets with the Secretary General to decide health policy. The Secretary General maintains liaison with other ministries such as the Ministry of Agriculture and Agrarian Reform (which supervises veterinary inspection of meat) and the Ministry of Education . . ." (Synthesis, pp. 59-60).



complex surveys. The identified problems can then be addressed in specific programs.

If action is taken on one of the alternatives suggested in the analysis (those indicated in the heavily outlined boxes in the chart), the costs and the effects which are explicitly stated in the analysis are predictions of the changes that will occur when the implementation has been completed. The comparison of these predicted costs and effects with the actual costs and effects serves as an evaluation of the above procedures.

It is important to note that extensive, and therefore expensive, studies are in general not being advocated here. For example, only at certain points in the decision model would a consumption survey be done. The objective is to minimize expensive data gathering and analysis and try to focus what is gathered on specific issues facing the planner.

### 5.3 Control and Measurement of Food Contamination

Some types of food contamination are closely related to under-nourishment (such as irrigation with raw sewage, etc.). These have been discussed above. Other types of food contaminations such as might occur in processed food and food contamination in the preparation of food in institutions (including restaurants, school lunch programs and industry) may not have their effects become evident in nutritional status but more likely in emergency medical care units.

The extent of food contamination is not known for Syria. It is likely to be small but also is likely to increase with the increased uses of processed food and more advanced agricultural techniques. Greater use of pesticides, insecticides and fungicides in agriculture, more food processing plants, more technical preservation methods will require food inspection and quality control systems that protect the public from intoxication from such products.

At this time, we only suggest that food standards for purity be set and a monitoring system be designed and implemented as a pilot operation for a small set of selected foods.

### 5.4 Incorporation of Science-Based Planning Procedures into Health and Nutrition Planning

The lack of documentation of studies and analyses was the greatest difficulty for the assessment team. Apparently important decisions are being made without detailed analyses or diagnoses. Some examples of decisions for which no systematic studies or analyses could be uncovered were:

- a) Decisions on price setting of basic food commodities. No documentation was found which analyzed the effect of the prices on nutrient consumption. No analysis was detected concerning effects of subsidized pricing systems on rural area consumption versus urban area consumption. While the

CBS survey is instructive, neither it nor any other study addresses the question of eating habits and food wastage. It is easy to observe, at least in the urban areas, a large wastage of bread but no analysis seems to exist which relates the amount of waste to the price (neither for bread nor for any of the other foods for which prices are controlled by the government). Even if for political reasons the decision is to keep the prices fixed at their present low values, the knowledge of the cost (monetary as well as wastage) of such a policy is valuable.

- b) Decisions on the selections of food for lunch programs. There exist classical scientific methods for selecting optimum diets (by linear programming). No evidence was found that such analyses had been done for the SAR school program.
- c) No studies were located on: (i) the relationship between livestock production and the quality and quantity of nutrients available for consumption at the family level; (ii) the relationship between health and sanitation programs and undernourishment (or morbidity and mortality); and (iii) the relationship between food storage and preservation programs and nutrient availability for the citizens.

Yet, decisions have been made in the past and will be made in the future (for the next Five Year Plan) on livestock production, health and sanitation, storage and preservation, and prices for basic food commodities. It appears as if the planning process consists all too often of the presentation of personal opinions in committee meetings, when more precisely knowing the costs and benefits of nutrition-related programs would be of great use to the decision-makers.

The general orientation of all the above recommendations is to emphasize techniques for making the planning process more efficient. By adopting such an orientation, it is hoped that a foundation would be laid for improving the planning process by comparing the predictions of the analyses which are carried out with the actual results of implementation of the decisions. The difference between predictions and results would then feed back into the implemented programs or into the analysis methods to determine where the errors have occurred. In effect, with properly designed analyses, it becomes possible to build the scientific learning model into the government function of planning. Of course, macroeconomic planning models currently attempt to build in the same learning process, but what seems not to be realized is that this scientific learning process can be built into all levels of planning, and especially into planning which affects the nutritional status of the people of Syria.

(an increase of 158 percent). Growth in the number of secondary level vocational/technical school instructors fell somewhere in between: 212.4 percent.

Because of differences in student-teacher ratios for primary, intermediate and general secondary, and secondary technical schools, respectively (see Table 6), teacher increases do not translate into equivalent levels of growth in student enrollments for each type of school. In the case of primary schools, which have the highest student-teacher ratio, enrollment increases at 110.2 percent nearly kept pace with teacher growth. Growth in the number of intermediate and general secondary students, 321 percent, was about three-fifths of the teacher expansion rate, and in the case of secondary technical schools student increases of 124.3 percent were only about one-half of teacher expansion.

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TABLE 6: STUDENT-TEACHER RATIOS BY TYPE AND LEVEL OF SCHOOL, 1963-1977

School	Student-Teacher Ratio		
	1963	1971	1977
Primary	37.1	36.8	30.2
Intermediate and general secondary	21.0	23.4	17.0
Technical secondary	13.3	7.9	9.6

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SOURCE: Statistical Abstract (1978)

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While the decline in the student-teacher ratio for primary schools can be considered to be a favorable development, low ratios at the post-primary levels especially in technical secondary schools may indicate that these institutions are operating below capacity. In view of access difficulties to be outlined below, which are particularly severe for technical schools, the apparent underutilization of teaching staff potential may be partially explained by these access problems. Low student-teacher ratios may also be due to the fact that many vocational school instructors teach only part-time.

The desire to alter the balance at the secondary level between general and technical/vocational enrollments in favor of the latter is specified in the Fourth Five Year Plan with targets set for each planning period year. Between 1975 and 1980 the intention is to reduce the proportion of intermediate school graduates entering general secondary schools from 70 percent to 50 percent (Fourth Five Year Plan, pp. 33-34).



Despite marked growth, less so in agricultural than in commercial and industrial branches, and despite a measure to raise monthly stipends for vocational students from 50 S.L. to 100 S.L. as of 1977, little progress is evident in achieving these goals. The percentage of students in general secondary to the total at this level (including those in teacher training colleges) has remained rather stable--81.6 percent in 1975, 81.2 percent in 1976 and 81.5 percent in 1977 (calculated from Statistical Abstract, 1978). Furthermore, of the cohort of students in their first year of secondary studies in 1977, only 17.1 percent were enrolled in vocational/technical schools (excluding those in teacher training colleges since no single-year data are available for them).

Overall enrollment rates in 1975 by level were:

Primary	89%
Intermediate	55%
Secondary	32%
Higher	12%

Despite numerical increases, disparities in educational opportunity by region, by sex and between rural and urban areas persist. Girls from rural areas of the least urbanized Mohafazat are worst off:

Enrollment of girls at primary and lower secondary levels vary from as low as 8 percent and 3 percent of total enrollments in rural Deir-ez-zor to 49 percent and 44 percent in Damascus City against the national averages of 39 and 31 percent respectively (World Bank Report).

2.2.2 Distribution of Educational Resources by Mohafazat: On the whole, the distribution of educational resources has been roughly proportional to population of the various Mohafazat, and the level of preexisting inter-Mohafaza imbalances has been reduced somewhat over the last fifteen years. Basically, this process has meant a gradual erosion of the preeminent position originally held by Damascus, a development that has been more evident at the primary than at the intermediate or secondary level: with 24.4 percent of the Syrian population, Damascus (1977 estimate) contained 22.9 percent of total primary and 27.7 percent of total secondary school teachers (Tables 7 and 8); also, while only 14.9 percent of new primary school teachers entering the field between 1971 and 1977 ended up in Damascus, almost twice the proportion of secondary school teachers did, 28.2 percent (see Tables 9 and 10).

The main beneficiaries of the growth and resource redistribution occurring between 1963 and 1977 were Lattakia/Tartous, Homs and Dar'a, both at the elementary and secondary levels, and Hama and Sweida, only at the secondary level (see Tables 11 and 12). These Mohafazat were beneficiaries of educational investment policies in the sense that they came to possess a larger share of total teachers than their respective shares of 1977 population.



TABLE 7: DISTRIBUTION OF PRIMARY SCHOOLS AND TEACHERS BY MOHAFAZAT, 1963-1977

Mohafazat	Population (%)		Schools (%)			Teachers (%)		
	1970	1977	1963	1971	1977	1963	1971	1977
Damascus	20.3	24.4	16.5	11.9	10.9	28.3	26.5	22.9
Aleppo <sup>a</sup>	29.9	30.2	24.8	30.2	34.7	27.0	25.6	26.9
Homs	9.6	8.5	9.4	8.8	8.0	8.8	9.5	9.7
Hama	8.6	8.1	8.3	10.3	9.2	7.8	8.4	10.0
Lattakia <sup>b</sup>	12.5	10.6	15.0	13.5	13.0	10.2	10.8	13.1
Deir-ez-zor	4.9	4.5	3.9	3.8	2.8	3.9	4.3	2.6
Al-Hasakeh	5.2	7.2	13.6	13.2	14.5	6.6	5.7	6.3
Sweida	3.0	2.2	4.3	3.6	2.8	3.2	3.4	3.1
Dar'a <sup>c</sup>	<u>5.9</u>	<u>4.2</u>	<u>4.6</u>	<u>4.7</u>	<u>4.2</u>	<u>4.2</u>	<u>5.6</u>	<u>5.3</u>
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

NOTE: Consolidation of these Mohafazat was necessitated in order to enable use of tables prepared by Duncan for years 1963 and 1971 for which I had no data disaggregated by Mohafaza.

SOURCE: 1963, 1971: Statistics taken from D. A. Duncan, "Center and Periphery in Syria: A Political-Geographical Study," Ph.D. thesis, University of Michigan, 1977, p. 18.

1977: Unpublished statistics from CBS.

TABLE 3: DISTRIBUTION OF INTERMEDIATE AND SECONDARY SCHOOLS AND TEACHERS BY MOHAFAZAT, 1963-1977

Mohafazat	Population (%)		Schools (%)			Teachers (%)		
	1970	1977	1963	1971	1977	1963	1971	1977
Damascus	20.3	24.4	25.7	21.7	20.0	34.2	27.2	27.7
Aleppo <sup>a</sup>	29.9	30.2	24.7	21.7	24.9	25.2	22.0	21.8
Homs	9.6	8.5	11.7	12.0	10.6	9.1	11.3	9.7
Hama	8.6	8.1	8.3	9.6	10.9	7.2	9.1	7.6
Lattakia <sup>b</sup>	12.5	10.6	13.5	19.3	15.5	11.9	15.0	16.1
Deir-ez-zor	4.9	4.5	3.1	2.9	3.0	2.6	3.6	4.3
Al-Hasakeh	5.2	7.2	4.4	3.8	3.5	3.3	4.9	5.9
Sweida	3.0	2.2	3.1	2.5	2.5	3.0	2.8	1.6
Dar'a <sup>c</sup>	5.9	4.2	5.4	6.4	6.1	3.5	4.0	5.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: 1963, 1971: Statistics adapted from D. A. Duncan, "Center and Periphery in Syria: A Political-Geographical Study," Ph.D. thesis, University of Michigan, 1977, p. 194.

1977: Statistics from Statistical Abstract (1978).

TABLE 9: % DISTRIBUTION OF NEW PRIMARY SCHOOL  
TEACHERS, 1971-1977, BY MOHAFAZAT

Mohafazat	% of New Teachers
Damascus	14.9
Aleppo <sup>a</sup>	29.9
Homs	9.8
Hama	9.3
Lattakia <sup>b</sup>	16.7
Deir-ez-zor	3.2
Al-Hasakeh	7.4
Sweida	3.4
Dar'a <sup>c</sup>	<u>5.4</u>
TOTAL	100.0

<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: Based on Statistical Abstract (1978),  
p. 473.

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TABLE 10: % DISTRIBUTION OF NEW INTERMEDIATE  
AND SECONDARY SCHOOL TEACHERS,  
1971-1977, BY MOHAFAZAT

Mohafazat	% of New Teachers
Damascus	28.2
Aleppo <sup>a</sup>	21.6
Homs	7.8
Hama	6.2
Lattakia <sup>b</sup>	17.1
Deir-ez-zor	5.0
Al-Hasakeh	6.8
Sweida	0.6
Dar'a <sup>c</sup>	<u>6.7</u>
TOTAL	100.0

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<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: Prepared on basis of Statistical Abstract (1978), p. 483.

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TABLE 11: % INCREASE IN NUMBER OF PRIMARY  
SCHOOL TEACHERS, 1971-1977,  
BY MOHAFAZAT

<u>Mohafazat</u>	<u>% Increase</u>
Damascus	34.3
Aleppo <sup>a</sup>	71.5
Homs	63.3
Hama	67.6
Lattakia <sup>b</sup>	94.6
Deir-ez-zor	45.4
Al-Hasakeh	79.0
Sweida	61.2
Dar'a <sup>c</sup>	<u>59.4</u>
SYRIA	62.3

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<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: Based on statistics from Statistical Abstract (1978), p. 473.

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TABLE 12: % INCREASE IN NUMBER OF  
INTERMEDIATE AND SECONDARY  
SCHOOL TEACHERS, 1971-1977,  
BY MOHAFAZAT

<u>Mohafazat</u>	<u>% Increase</u>
Damascus	116.4
Aleppo <sup>a</sup>	110.3
Homs	77.7
Hama	76.6
Lattakia <sup>b</sup>	128.0
Deir-ez-zor	155.7
Al-Hasakeh	156.9
Sweida	24.7
Dar'a <sup>c</sup>	187.6
SYRIA TOTAL	114.5

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<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: Prepared on basis of Statistical Abstract (1978), p. 485.

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This was not the case in Deir-ez-zor and Al-Hasakeh, despite impressive rates of increase in these two Mohafazat.

Intermediate and secondary education budget allocations detailed in the Fourth Five Year Plan also favor Damascus, Lattakia, Tartous and Homs, replicating the actual pattern of growth observed up to 1977 (see Table 13). However, it appears that the actual gains of Dar'a, Hama and Sweida made until 1977 surpassed what might have been expected from budgetary allotments; the converse seems to be true for Aleppo. These inconsistencies may be due merely to the fact that the inter-Mohafaza balance observed in 1977 does not reflect the picture which may ultimately emerge in 1980, the end of the planning period.

Another way of looking at the relative emphasis given to post-elementary education in each of the Mohafazat is through the proportion of total educational expenditures going to these higher levels. Mohafazat in which this proportion exceeded the national average of 36.8 percent were: Damascus, with 73.9 percent; Lattakia, 56.1 percent; Tartous, 43.1 percent; and Hama, with 38.0 percent (see Table 14).

Budgetary allocations also indicate which Mohafazat were targeted for the greatest relative development of secondary vocational and technical education. In terms of inter-Mohafaza shares of total money devoted to this branch, allocations to Lattakia, Homs and Al-Rakka surpass their respective shares of the population (see Table 15).

Since each of these Mohafazat is the focus of other large development activities--the port and university in Lattakia, oil refineries in Homs and the Euphrates Dam in Al-Rakka--planned allocations represent an effort to produce needed manpower locally.

Mohafazat in which the ratio of vocational and technical education to total post-elementary allocations is highest are Lattakia with 53.3 percent, Sweida, 41.7 percent, Deir-ez-zor with 30.8 percent, Homs, 25.6 percent, and Dar'a, 22.2 percent, which are all significantly above the national average of 18.8 percent (see Table 16).

2.2.3 Implications for the Access of Rural Residents to Education: To assess what the rural access implications of these developments have been, reference must be made to the disposition of facilities and staff at each school level vis-à-vis service targets--villagers living in each of the Mohafazat. As explained in the introduction, absence of a school in a village raises the issue of physical access difficulties and other direct and indirect costs for rural families desiring to send their children to school.

Referring to Table 17 which depicts the proportion of villages without schools, we find that Mohafazat in which this proportion is high (more than 10 percent) are characterized by settlements of small average size (those with up to 800 residents). Similarly,

TABLE 13: % DISTRIBUTION OF BUDGETARY ALLOCATIONS  
FOR INTERMEDIATE AND SECONDARY EDUCATION,  
1975-1980, BY MOHAFAZAT

Mohafazat	% Population (1976)	% Distri- bution
Damascus	24.4	36.7
Aleppo	10.5	18.4
Homs	8.5	10.6
Hama	8.1	6.6
Idleb	5.8	3.9
Lattakia	5.9	9.9
Tartous	4.7	5.4
Deir-ez-zor	4.5	3.7
Al-Hasakeh	7.2	3.7
Al-Rakka	3.8	2.6
Dar'a	3.9	2.4
Sweida	2.2	1.8
Quneitra	0.2	0.9
TOTAL	100.0	100.0

SOURCE: Prepared from data in Fourth Five Year Plan.



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TABLE 14: % OF TOTAL EDUCATION BUDGET  
ALLOCATED TO INTERMEDIATE AND  
SECONDARY LEVELS,\* 1975-1980,  
BY MOHAFAZAT

<u>Mohafazat</u>	<u>% of Total Budget</u>
Damascus	73.9
Aleppo	31.3
Homs	33.8
Hama	38.0
Idleb	30.5
Lattakia	56.1
Tartous	43.1
Deir-ez-zor	29.3
Al-Hasakeh	23.0
Al-Rakka	30.8
Dar'a	27.5
Sweida	28.8
Quneitra	33.3
SYRIA	36.8

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\*Includes both general and vocational-  
technical education.

SOURCE: Calculated on basis of figures  
in Fourth Five Year Plan.

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TABLE 15: % DISTRIBUTION OF BUDGETARY ALLOCATIONS  
FOR VOCATIONAL AND TECHNICAL EDUCATION,  
1975-1980, BY MOHAFAZAT

Mohafazat	% Population (1976)	% Distri- bution
Damascus	24.4	20.4
Aleppo	10.5	8.9
Homs	8.5	13.6
Hama	8.1	3.4
Idleb	5.8	1.4
Lattakia	5.9	21.8
Tartous	4.7	5.4
Deir-ez-zor	4.5	5.4
Al-Hasakeh	7.2	4.1
Al-Rakka	3.8	9.5
Dar'a	3.9	2.7
Sweida	2.2	3.4
Quneitra	0.2	--
TOTAL	100.0	100.0

SOURCE: Prepared from data in Fourth Five Year  
Plan.

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TABLE 16: DISTRIBUTION OF MOHAFAZAT BY RATIO (%)  
OF VOCATIONAL AND TECHNICAL EDUCATION  
TO GENERAL INTERMEDIATE AND SECONDARY  
ALLOCATIONS, 1975-1980

Mohafazat	% Allocations
Damascus	9.7
Aleppo	8.2
Homs	25.6
Hama	8.9
Idleb	5.9
Lattakia	53.3
Tartous	19.0
Deir-ez-zor	30.8
Al-Hasakeh	21.4
Al-Rakka	1.4
Dar'a	22.2
Sweida	41.7
Quneitra	0.0
TOTAL	100.0

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SOURCE: Prepared from budget data in Fourth Five  
Year Plan.

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TABLE 17: PROPORTION OF VILLAGES WITHOUT SCHOOLS, AND AVERAGE VILLAGE SIZE BY MOHAFAZAT, 1977

Mohafazat	% Without <sup>(a)</sup> School (%)	Average Village <sup>(b)</sup> Population
Damascus	6.7	2,579
Aleppo	12.7	494
Homs	12.8	725
Hama	no information	855
Lattakia	16.4	541
Deir-ez-zor	19.2	1,812
Idleb	5.9	822
Al-Hasakeh	47.6	262
Al-Rakka	3.6	892
Sweida	3.9	976
Dar'a	0.0	2,173
Tartous	20.9	560
Quneitra	no information	122

SOURCE: (a) Unpublished statistics from CBS.

(b) Statistical Abstract (1978).



in all Mohafazat with larger villages (more than 800 residents), more than 90 percent of the villages have schools. The most extreme negative case is Al-Hasakeh: 47.6 percent of its villages are without any school facilities and average village size is the smallest of all Mohafazat (except Quneitra)--262 residents. Other Mohafazat sharing these joint features are Tartous, Lattakia and Aleppo. The only exception to this tendency is Deir-ez-zor, where despite large average village size the proportion without schools remains large.

Data from the Village Survey duplicate this pattern (see Table 18): of those 25 villages with less than 400 residents, 44 percent lack schools of any type; of those between 400-799, schools are absent in 9.1 percent of villages; and in the 56 villages with populations over 800, all have at least an elementary school.

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TABLE 18: PROPORTION (%) OF VILLAGE SURVEY  
SAMPLE VILLAGES WITHOUT SCHOOLS,  
BY POPULATION SIZE GROUP

Population	Total (n)	Without	
		(n)	(%)
0-399	25	11	44.0
400-799	22	2	9.1
800+	56	0	0
TOTAL	103	13	12.6

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These data reflect the declared government aim of giving priority for the supply of basic services to larger villages with populations in excess of 500. But the fact that smaller villages are more prevalent in certain regions than in others (see Table 17) suggests that special policy measures need to be developed for such areas. A central village development strategy might be one possibility. Even where most villages have schools, Mohafazat and Manatik with large numbers of sub-village units (mezr'aa) per village confront special access problems which deserve attention. Such fragmentation is especially severe in Al-Hasakeh, Aleppo, Al-Rakka, Deir-ez-zor and Lattakia (see Table 19).

Intermediate level school facilities have been spread out to virtually all Manatik, most larger Nawahi centers, and some are now being located in larger villages as well. Among communities represented in the Village Survey sample (n = 103) no intermediate

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TABLE 19: AVERAGE NUMBER OF VILLAGES PER MANTIKA AND  
NAHIA CENTER, BY MOHAFAZAT

<u>Mohafazat</u>	<u>Villages per Mantika</u>	<u>Villages per Nahia</u>
Damascus	24	9
Aleppo	177	57
Homs	85	30
Hama	121	30
Lattakia	112	34
Deir-ez-zor	64	16
Idleb	81	27
Al-Hasakeh	409	182
Al-Rakka	251	36
Sweida	62	18
Dar'a	121	15
Tartous	102	37
Quneitra	82	41

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Calculated from the Statistical Abstract (1978)

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level schools existed in settlements with less than 1,000 inhabitants. But for those with between 1,000-2,000 the proportion was 18.8; for those with 2,000-2,999, 33.3 percent; and for villages with over 3,000 residents it rose to 100 percent.

As Table 19 illustrates, restriction of facilities to Manatik and/or Nawahi centers creates different levels of access problems in each of the Mohafazat. While intermediate level schools are no longer basically confined to Mantika, Nowahi and Mohafaza centers, this is not the case for secondary schools.

One indication of access difficulties encountered by students who may want to continue their studies beyond the intermediate level is that attrition rates are highest between the middle and secondary levels, as evidenced in enrollment rates by level (see Section 2.2.1). While a number of factors may be responsible (including the immediate income needs of families, etc.), the break in enrollment rates between these levels may be attributed to difficulties in sending a child to a Mantika or Mohafaza center to continue his or her schooling, particularly if commuting is impracticable to such places. Access difficulties are even more serious for more specialized technical vocational schooling at the secondary and post-secondary levels, since facilities are largely restricted to Mohafaza centers. Data obtained from a survey (1979) of second year students attending the Intermediate Institute of Agriculture in Damascus suggest what the access implications of such restrictions may be: of 105 responding students, 22 percent were women all from nonfarm backgrounds, most from Damascus; of the men, only about 10 percent had farm backgrounds and 21 percent were from areas outside the city of Damascus--75 percent were already living and working in the city.

Further evidence of access barriers especially for secondary vocational and technical education comes from Village Survey data (see Table 20). Almost half of the villages are over 40 km. from the nearest school of this type. Where facilities are located only in the Mohafaza center, as is usually the case, serious transportation difficulties existed in terms of travel time and quality of road connections. Of the sample villages, 46 percent were within one hour's drive to the Mohafaza center, 31 percent between one to two hour's away, and 23 percent over two hour's away (Table 21). Furthermore, 28 percent of villages lacked stabilized road connections (see Table 22), and for 11 percent roads to the Mohafaza center were closed for one month or more out of the year (Table 23). Thirty-three percent of villages were over 10 km. away from the nearest public bus service to the Mohafaza center (see Table 24). These facts should be kept in mind as we move on to examine health care delivery where concentration of personnel and facilities in large urban centers is even more prevalent than it is in education.

2.2.4 Health: The Pattern of Growth: Health services, like education, have undergone tremendous expansion since 1963. Growth has not, however, sufficiently reduced the maldistribution of

TABLE 20: DISTRIBUTION OF VILLAGES BY DISTANCE TO THE NEAREST SCHOOL, BY TYPE

Distance (km.)	School		
	Intermediate (%)	Secondary (General) (%)	Secondary Vocational-Technical (%)
0	18.4	5.9	--
1-5	21.4	14.6	0.9
6-10	21.4	20.4	3.8
11-20	17.5	20.4	10.7
21-30	10.7	12.7	11.7
31-40	0.9	6.8	16.5
41-50	0.9	4.9	14.6
50+	5.8	10.7	33.0
No information	3.0	3.6	8.7
TOTAL	100.0	100.0	100.0



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TABLE 21: DISTRIBUTION OF VILLAGE SURVEY  
COMMUNITIES BY CAR TRAVEL TIME  
TO THE MOHAFAZA CENTER

Travel Time (hours)	Villages (%)
Less than $\frac{1}{2}$	10.0
$\frac{1}{2}$ -1	36.0
1- $1\frac{1}{2}$	16.5
$1\frac{1}{2}$ -2	14.5
More than 2	23.0
TOTAL	100.0 (n = 103)

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TABLE 22: DISTRIBUTION OF SURVEY VILLAGES  
BY NUMBER OF STABILIZED ROADS  
LEADING TO THE VILLAGES

No. of Roads	Villages (%)
No roads	28.2
1 road	48.5
2 roads	16.5
3 roads	3.9
More than 3	2.9
TOTAL	100.0

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TABLE 23: DISTRIBUTION OF VILLAGE SURVEY  
COMMUNITIES BY NUMBER OF DAYS  
ROAD TO MOHAFAZA CENTER IS CLOSED

<u>No. of Days</u>	<u>% of Villages</u>
0	63
Less than 7	14
8-14	5
15-30	8
31-45	1
46-60	2
More than 60	<u>0</u>
TOTAL	103

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TABLE 24: DISTRIBUTION OF VILLAGES BY  
DISTANCE TO NEAREST PUBLIC BUS  
SERVICE TO THE MOHAFAZA CENTER

<u>Distance (km.)</u>	<u>Villages (%)</u>
0	45.6
1-5	12.6
6-10	8.7
11-20	11.7
21-30	5.8
31-40	2.9
41-50	2.9
50+	<u>9.7</u>
TOTAL	100.0

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health personnel and facilities which has continued to favor urban areas, especially the largest ones--Damascus and Aleppo. With about three-fourths of health services in the private sector, the State has been unable to control the allocation, particularly of personnel across the country.

Doctors, the keystone of the health delivery structure, are free agents and, except for two years of compulsory rural service upon graduation, are able to set up practices wherever they desire. Their collective preference is clearly to practice in Damascus or Aleppo. Approximately three-fourths of doctors in Syria congregated in these two Mohafazat in 1977, and half of the nation's doctors live in Damascus and Aleppo Cities (see Table 25). Doctors in many other areas of the country (particularly in Homs, Hama and Lattakia) also tend to be attracted to urban centers, particularly to the centers of each Mohafaza, though the extent to which this is true varies. In the smaller, more rural Mohafazat which are not as dominated by large cities such as Damascus, Aleppo, Homs, Hama and Lattakia, doctors are less concentrated in the Mohafazat centers. However, because the total number of doctors tends also to be relatively small, the distributional impact remains minor.

Given the overwhelming urban concentration of doctors, progress indicated by a steady reduction in the population-to-doctor ratio in all areas of the country since 1963 (see Table 26) probably failed to benefit rural residents to the extent that one might otherwise have expected. However, the overall progress since 1963 in reducing the differences among Mohafazat, rural and urban, is noteworthy (see Figure 2). The range in patient:doctor ratios is from 1,250 in the Damascus Mohafaza to 7,909 in Sweida in 1977, whereas in 1963 the ratios were 2,541 and 22,091, respectively. Since 1971 less spectacular improvements have been achieved, although the general trend toward lowering the patient:doctor ratios has continued. Some areas of the country have been improving less than others and also still have the highest ratios, namely, Deir-ez-zor, Dar'a and Quneitra, Sweida and Al-Hasakeh. Al-Hasakeh had a higher ratio in 1977 than in 1973. All of these areas are still highly rural and would seem to require special rural health programs to get more doctors working among the rural villages.

There are obvious difficulties in getting more doctors to rural areas. Facilities in outlying areas have had mostly to rely on fresh medical school graduates performing their compulsory two-year obligation. Personnel recruitment and retention remain serious problems outside the major cities.\*

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\*Staff recruitment problems arose in the cases of hospitals built in Al-Rakka and Al-Hasakeh in 1976 (Syncrisis, p. 83). Similar problems were encountered in staffing 50 clinics constructed as part of a UNICEF-assisted program.

TABLE 25: DISTRIBUTION OF DOCTORS BY MOHAFAZAT AND PERCENT-  
AGE OF DOCTORS LOCATED IN MOHAFAZA CENTERS, 1977

Mohafazat	Total Doctors in Mohafaza	% in Center
Damascus	892	81.4
Aleppo	700	92.1
Homs	135	80.0
Hama	100	64.0
Lattakia	101	79.0
Deir-ez-zor	39	56.4
Idleb	42	33.3
Al-Hasakeh	53	24.5
Al-Rakka	27	37.0
Sweida	24	33.3
Dar'a	33	27.3
Tartous	42	40.0
Quneitra	10	--
SYRIA	2,198	82.5

SOURCE: Unpublished statistics prepared by Central Bureau  
of Statistics.



TABLE 26: PATIENTS PER DOCTOR BY MOHAFAZA, 1963-1977

Mohafaza/Region	1963	1971	1977 <sup>d</sup>
Damascus	2,541	1,726	1,250 <sup>e</sup>
Aleppo <sup>a</sup>	6,239	4,996	2,941
Homs	8,891	4,235	3,264
Hama	8,911	8,167	3,843
Lattakia <sup>b</sup>	8,678	6,844	4,238
Deir-ez-zor	11,124	5,322	5,238
Al-Hasakeh	7,425	10,432	7,712
Sweida	22,091	11,577	7,909
Dar'a	15,074	8,971	8,024
SYRIA	5,494	3,788	2,515

<sup>a</sup>Includes Idleb and Al-Rakka.

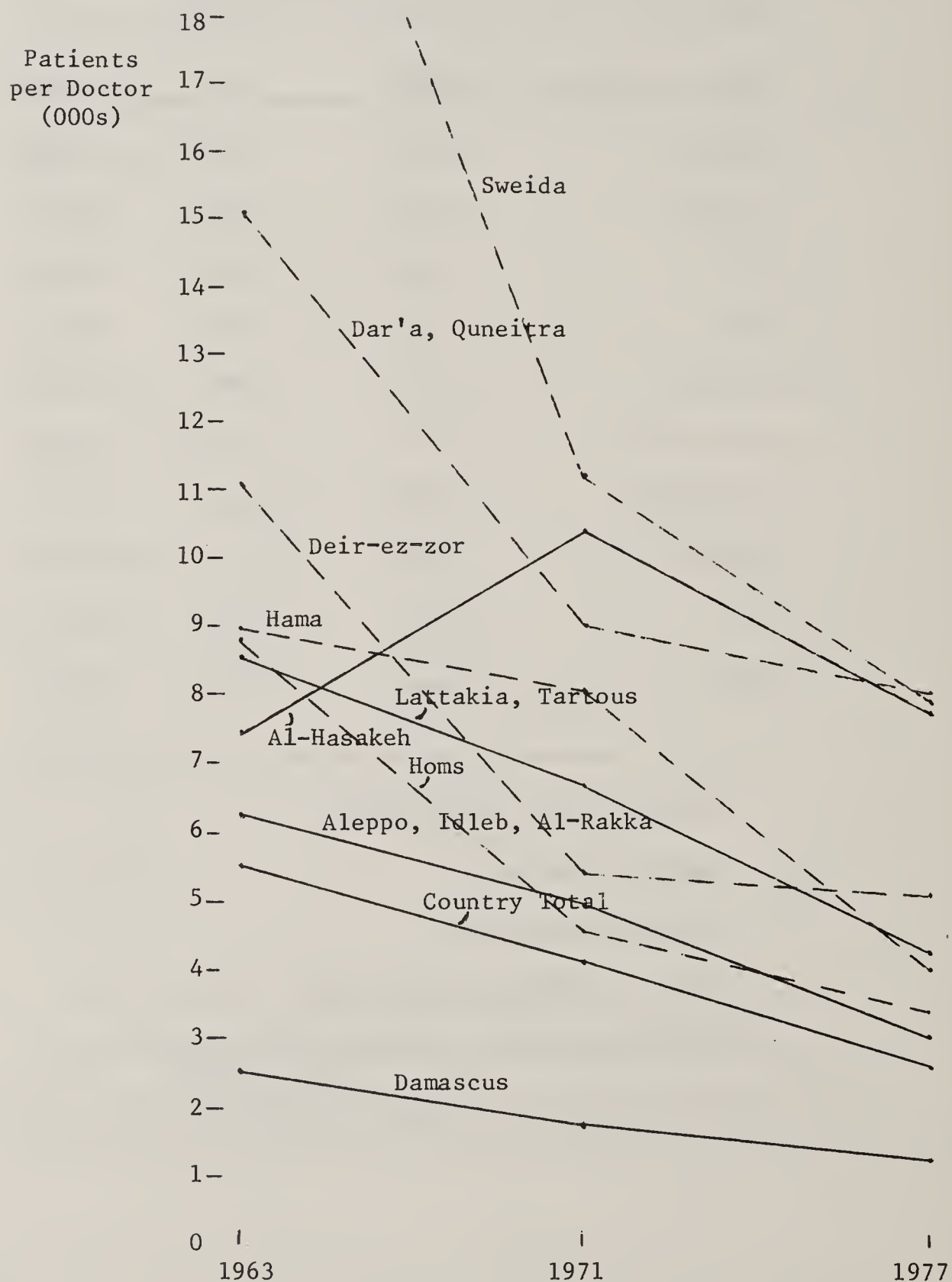
<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

<sup>d</sup>Based on Statistical Abstract (1978), p. 516.

<sup>e</sup>In Damascus City, 973 patients per doctor.

FIGURE 2: NUMBER OF PATIENTS PER DOCTOR IN 1963, 1971 AND 1977  
IN VARIOUS REGIONS OF THE S.A.R.



The State does have greater authority over the location of hospitals and clinics than its doctors and these are consequently more evenly distributed. Government hospital expansion since 1963 has slightly reduced the preeminent position of Damascus to the particular benefit of Deir-ez-zor, Hama, Aleppo and Lattakia Mohafazat (see Table 27). The actual extent of such redistribution is more accurately reflected, however, by looking at relative hospital capacity measured by the number of hospital beds (see Tables 28 and 29). As of 1977, Damascus with 24.4 percent of the population still contained a disproportionate share of the country's total. Despite consistent gains in Homs, Hama and Lattakia/Tartous, these Mohafazat still had a smaller share of beds than their population warranted. The most notable deficit Mohafazat were Al-Hasakeh, Idleb, Al-Rakka and Tartous. In terms of hospital beds per 10,000 population, Damascus ranked first with 14, Aleppo and Sweida second with 12 (see Table 30).

2.2.5 Implications for Rural Access to Health Facilities: To more accurately assess the implications of these aggregate Mohafaza-level measures on service availability for rural people, such measures must be considered in conjunction with the degree of hospital and hospital bed dispersal within Mohafazat. Again, the picture is one of urban concentration. Two-thirds of all hospitals with about four-fifths (77.7 percent) of all beds are located in Mohafaza centers (see Table 31). Of the remainder, most are confined to Mantika centers, with the exceptions of two hospitals in Duma, Damascus, and one located in a Nahia center of Aleppo. Location and distribution of hospitals and hospital beds outside Mohafaza centers is given below in Table 32. Allocations for further hospital construction detailed in the Fourth Five Year Plan reveal that Mantika centers are to be favored in the next phase of expansion: 11 of 15 proposed new hospitals are to be located in such centers with the remainder designated for Nahia centers.

For people living in the countryside, health clinics are the facility with which they are most likely to come into contact. Compared to hospitals, the 300 health clinics are much more evenly spread out and are found in Mantika, Nahia centers and large villages.\* A possible reflection of this fact is that 69 percent of communities represented in the Village Survey are 20 km. or less from the nearest clinic (see Table 33). Service load per clinic in terms of rural population and average number of villages served varies considerably from Mohafaza to Mohafaza, as Table 34 illustrates. In terms of future health program design priorities for clinic construction should be Dar'a-Quneitra, Tartous-Lattakia, Al-Hasakeh and Aleppo, where the number of villages per clinic is large.

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\*According to the Fourth Five Year Plan, 81 new health centers are to be built "in centers of large Mohafazat as well as in medium and small ones, in Nahias and populous villages."

TABLE 27: DISTRIBUTION OF GOVERNMENT HOSPITALS,  
BY MOHAFAZAT, 1963-1977

Mohafazat	Hospitals <sup>d</sup> (%)		
	1963	1971	1977
Damascus	31.0	33.0	26.0
Aleppo <sup>a</sup>	31.0	27.0	29.0
Homs	4.0	3.0	3.0
Hama	4.0	6.0	6.5
Lattakia <sup>b</sup>	8.0	9.0	10.0
Deir-ez-zor	8.0	9.0	13.0
Al-Hasakeh	8.0	6.0	6.5
Sweida	4.0	3.0	3.0
Dar'a <sup>c</sup>	4.0	3.0	3.0
TOTAL	100.0	100.0	100.0

<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

<sup>d</sup>State hospitals, excluding sanatoriums, from  
Statistical Abstract (1978), p. 518.

SOURCE: 1963, 1971: Statistics from D. A. Duncan,  
"Center and Periphery in Syria: A Political-Geographical Study," Ph.D. thesis,  
University of Michigan, 1977, p. 206.

1977: Based on unpublished statistics from  
Central Bureau of Statistics.



TABLE 28: DISTRIBUTION OF GOVERNMENT HOSPITAL BEDS, BY MOHAFAZAT, 1963-1977

Mohafazat	Hospital Beds (%)			Hospital Beds/10,000		
	1963	1971	1977	1963	1971	1977
Damascus	50.4	52.6	47.2	17.5	19.0	16.0
Aleppo <sup>a</sup>	19.8	16.7	21.4	4.5	4.5	5.9
Homs	5.0	4.3	6.8	3.7	4.2	6.7
Hama	2.9	2.6	3.3	2.7	2.7	3.4
Lattakia <sup>b</sup>	5.6	8.5	8.3	3.3	6.5	6.5
Deir-ez-zor	10.0	7.7	7.4	13.1	13.9	13.8
Al-Hasakeh	2.2	1.4	1.2	2.8	1.5	1.3
Sweida	1.4	4.1	3.0	3.4	15.5	11.3
Dar'a <sup>c</sup>	2.4	1.9	1.5	4.0	4.3	3.0
SYRIA TOTAL	100.0	100.0	100.0	7.1	8.3	8.3

<sup>a</sup>Includes Idleb and Al-Rakka.

<sup>b</sup>Includes Tartous.

<sup>c</sup>Includes Quneitra.

SOURCE: 1963, 1971: Data adapted from D. A. Duncan, "Center and Periphery in Syria: A Political-Geographical Study," Ph.D. thesis, University of Michigan, 1977, p. 210.

1977: Unpublished data from Central Bureau of Statistics.

TABLE 29: DISTRIBUTION OF HOSPITAL BEDS, BY MOHAFAZAT, 1977

Mohafazat	Population (%)	Private and State <sup>a</sup> Hospital Beds (%)	State Hos- pital Beds <sup>a</sup>
Damascus	24.4	37.3	39.7
Aleppo	20.6	27.0	23.5
Homs	8.5	8.7	6.4
Hama	8.1	4.8	4.5
Lattakia	5.9	5.3	5.9
Deir-ez-zor	4.5	4.0	5.0
Idleb	5.8	2.4	2.9
Al-Hasakeh	7.2	2.3	3.0
Al-Rakka	3.8	1.5	1.2
Sweida	2.2	2.7	3.5
Dar'a	3.9	2.0	2.5
Tartous	4.7	1.8	2.1
Quneitra	0.3	--	0.0
TOTAL	100.0	100.0	100.0

<sup>a</sup>Based on Statistical Abstract (1978).

TABLE 30: HOSPITAL BEDS\* PER 10,000 POPULATION,  
BY MOHAFAZAT, 1977

<u>Mohafazat</u>	<u>Government Hospital Beds</u>	<u>Government and Private Hospital Beds</u>
Damascus	12	14
Aleppo	8	12
Homs	6	10
Hama	4	6
Lattakia	7	8
Deir-ez-zor	8	9
Idleb	4	4
Al-Hasakeh	3	3
Al-Rakka	2	4
Sweida	12	12
Dar'a	5	5
Tartous	3	3
Quneitra	0	0

\* Rounded to nearest whole number.

SOURCE: Calculated on the basis of Statistical Abstract (1978) figures for 1977 population estimates (p. 103) and hospital beds (p. 518).

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TABLE 31: PERCENTAGE OF HOSPITAL BEDS,  
GOVERNMENT AND PRIVATE,  
IN MOHAFAZA CENTERS, 1977

<u>Mohafazat</u>	<u>Percentage</u>
Damascus	75.8
Aleppo	82.7
Homs	100.0
Hama	63.4
Lattakia	100.0
Deir-ez-zor	64.9
Idleb	100.0
Al-Hasakeh	33.3
Al-Rakka	100.0
Sweida	100.0
Dar'a	100.0
Tartous	24.8
Quneitra	--
SYRIA	77.7

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SOURCE: Unpublished statistics supplied by Central Bureau of Statistics.

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TABLE 32: DISTRIBUTION AND LOCATION OF HOSPITALS AND HOSPITAL BEDS OUTSIDE MOHAFAZA CENTERS, 1977

Mohafazat	Mantika	No. of Hospitals	No. of Beds	% of Beds
Damascus	Duma	3	696	49.6
	Al-Nabek	1	50	3.6
Aleppo	Jabal Saman	1	210	15.0
Hama	Salmieh	1	15	1.1
Deir-ez-zor	Abou Kemal	1	50	3.6
	Mayadin	1	120	8.6
Al-Hasakeh	Al-Kamishli	1	50	3.6
Tartous	Al-Karmous	1	212	15.1
TOTAL		10	1,403	100.0

SOURCE: Unpublished statistics supplied by Central Bureau of Statistics.

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TABLE 33: % DISTRIBUTION OF VILLAGE  
SURVEY COMMUNITIES BY  
DISTANCE TO NEAREST CLINIC

<u>Distance (km.)</u>	<u>Percentage</u>
0	4.9
1-5	15.7
6-10	18.6
11-20	29.4
21-30	12.7
31-40	5.9
41-50	2.9
50+	9.8

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SOURCE: Village Survey (1979)

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TABLE 34: RURAL POPULATION AND VILLAGES PER CLINIC,  
BY MOHAFAZAT, 1977

Mohafazat	Population per Clinic	Average Villages per Clinic
Damascus	17,344	7
Aleppo	21,344	43
Homs	14,714	20
Hama	18,818	22
Lattakia	22,000	41
Deir-ez-zor	16,571	9
Idleb	15,136	18
Al-Hasakeh	25,235	96
Al-Rakka	16,000	18
Sweida	12,444	7
Dar'a	65,750	30
Tartous	28,700	51
Quneitra	--	163

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SOURCE: Number of clinics and villages from unpublished statistics from Central Bureau of Statistics; population based on estimates for 1977 from Statistical Abstract (1978), p. 103.

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The cost of delivering health care to dispersed rural areas is substantial as is the delivery of education, literacy training and agricultural extension. An alternative to having each Ministry establish its own separate service outpost in rural areas is to combine such service delivery systems into a single facility in each area. The Rural Development Centers (RDCs) represent Syria's main effort to do so. The experience with this strategy and its implications for the design of future rural social service delivery systems is explored in the following section.

### 3. Social Service Delivery through the Rural Development Centers

Rural Development Centers (RDCs) were introduced into Syria in 1959. The union with Egypt a year earlier paved the way for this development, since Egypt had adopted this approach in association with its own agrarian reform efforts in the early part of the same decade. This was a time when the community development approach was enjoying its heyday among international development circles, an approach which was based on a perception of development as a multifaceted rather than a unidimensional problem. Egypt's community development centers and those eventually introduced into Syria embodied this view by creating multiservice centers. Each center is designed to reach 40-50,000 rural people in order to provide agricultural extension services, health and literacy training. In addition, some centers provide training in carpet-, rug-weaving and sweater-making.

Six such centers now exist in Syria, with a seventh presently under construction in Al-Hasakeh Mohafaza (see Table 35). This number is substantially less than the original goal of at least one center in each Mohafaza. Reserve budgetary allocations for additional centers are set aside in the Fourth Five Year Plan, but

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TABLE 35: LOCATION OF RURAL DEVELOPMENT CENTERS

<u>Name of Center</u>	<u>Location (Mohafazat)</u>
Harran al-Awamid	Damascus
Ifreen	Aleppo
Joubet Bourghal	Lattakia
Mayadin	Deir-ez-zor
Nawa	Dar'a
Salkhad	Sweida

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the use of these funds has been postponed and probably will not be spent. The hesitancy to allocate further resources to RDCs derives from difficulties which the centers have experienced. Understanding the reasons for the inability of such centers to fulfill original expectations is critical for the development of alternative social service delivery programs in the future.

The RDC program has been implemented on a limited scale, but at the same time the efforts expended have been serious and extensive. With the exceptions of the Joubet Bourghal and Harran al-Awamid centers, RDCs are located in Nahia or Mantika centers. Spread across six Mohafazat, they collectively cover much of the broad spectrum of conditions prevailing in Syria. Although not spanning the full spectrum, enough variety exists to suggest certain implications that go beyond the operation of the centers themselves. This is particularly true in terms of the issue of how appropriate it may be to apply a central village concept in the design of a social service delivery system under different socio-ecological conditions. The purpose of this section is to analyze those implications.

### 3.1 Structure of the RDCs

Each center consists of four units: a health unit, an agricultural unit, a social unit, and a construction unit. Construction units originally were intended to organize community self-help building efforts of roads, schools and other local projects that are now inactive in all the centers. A description of the other units, which are active, is provided in the following sections.

3.1.1 Health Units: The health units are mainly geared to provide out-patient care, particularly for maternity and early childhood cases. Units have up to 15 beds primarily used for natal and post-natal care. Pharmacies existed in all the RDCs visited, with medicines prescribed being free of charge. On the whole, the orientation of RDC clinics is curative. Preventive care is confined to inoculation services with a special effort being made to reach villagers who might find it difficult to come to the center for direct attention. Between 1 and 3 vehicles (land-rovers) are provided for this purpose. Personnel consists of between 1 and 3 doctors, 1 and 2 nurses, midwives and sometimes a dentist. Added to these are between 1 and 4 health visitors who go to the homes of expectant mothers to give pre-natal advice. Post-natal follow-up visits are made and mothers are encouraged to periodically bring their infants to the center for monitoring. The clinics are open daily from 8:00 a.m. to 2:00 p.m. with an average number of 30 to 55 patients seen during these hours among the centers. Doctors spend between 2 and 3 days per week away from the RDC traveling to surrounding villages.

As for their place in the overall health care delivery system, the health unit clinics occupy an intermediate hierarchical position. Above them are the more elaborately equipped and staffed hospitals designed to deal with emergencies or chronic cases.

These are to be found in Mohafaza centers. Dispensaries and other clinics may be present in other Mantika, Nahia centers or other large villages. RDC clinics are specifically intended to extend medical services to villages without any permanent medical facility. For this system to work, it is necessary for the RDCs to have an effective mobile capacity. It is also necessary for villagers to have transport and communication links with the RDC or other sources of health service, particularly in emergency cases.

People resort to a variety of transport means. In some areas many would come to the center by tractor. Proximity to a village with a police station equipped with a telephone also proved to be important since the telephone could be used to alert vehicles to transport patients either to the RDC or to the Mohafaza center hospital. Under the best of circumstances a trip to the hospital would take two hours in the case of the mountainous Joubet Bourghal center area, while in Nawa a patient could be brought to the hospital in Dar'a, the Mohafaza center, within thirty minutes to one hour. In the latter case, villagers were said to be no more than 5 km. from the nearest phone, while in Joubet the initial alert for a vehicle could be difficult if not impossible due to absence of phone connections and the problem of going even a small distance on the rough mountain roads in the area--a problem exacerbated in the winter. Under the extreme conditions in Joubet, installation of radio communications and the use of helicopters would seem to be the only way to reach isolated settlements, given present conditions.

In general, a number of problems have plagued the RDCs' health units which apply as well to rural health care generally. Retaining staff has been difficult in the least developed areas with the most need for health care. As a result of limited resources, there has been an overemphasis on curative care. Preventive programs to reduce environmental causes of disease (improving water systems, draining swamps, etc.) could become a significant role of the now defunct RDC construction units, however. The need to improve water and sewage systems among communities in the Village Survey sample is clearly evident from Table 36.

Other problems include scheduling rigidity, which has the center open only during certain hours throughout the year. This scheduling tends to thrust costs of health care onto clients who are forced either to interrupt work to acquire the "free" medical care provided or else to see private doctors at another time. This problem is especially severe during peak labor demand periods such as harvest time.

Physical access and communications problems also occur in referring seriously ill patients to appropriate health care levels for special treatment. Clinics are oriented to deal with generally prevalent diseases and other problems instead of being adapted to treat locally prevalent medical problems. Being more adapted to locally prevalent diseases and capable of changing the clinic's

TABLE 36: % DISTRIBUTION OF SURVEY VILLAGES BY AVAILABILITY OF WATER AND SEWAGE FACILITIES

Availability	% of Villages with:		
	(1) Water Piped to Houses (%)	(2) Water Supplied to Village Center (%)	(3) Sewage/ Drainage (%)
Yes	18	28	8
No	82	72	92
TOTAL	100	100	100

medical services in accordance with local needs throughout the year would reduce referral requirements to more distant centers at a presently high private and social cost.

3.1.2 Social and Educational Units: These units undertake the following activities:

a) Literacy courses: Five-month-long courses\* are normally set up in a rotational sequence for several villages in the service area during each five-month term. Courses are conducted in existing school facilities under the instruction of village school teachers.

The duration of the course--five months--is probably too short to have a lasting effect on adult functional illiteracy in the absence of follow-up or refresher courses. Insufficient up-to-date material is available to reinforce the literacy skills which are acquired. Mobile libraries, also part of social and educational units, are of too limited a scope to correct this problem.

Literacy programs provided under the auspices of GADEB correct some of these shortcomings. Follow-up courses are offered, ample reading material--newspapers, books on history, economics and agriculture--is made available in the social and cultural centers constructed in each of the newly reclaimed area villages. Also

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\*Courses offered in the Joubet Bourghal center are just three months long.



a positive innovation is the combination of literacy education with handicraft courses for participating females.

In the case of both RDCs and GADEB, however, literacy programming could benefit from a stronger orientation toward functional literacy, i.e., literacy as a skill preparing peasants to operate more effectively vis-à-vis governmental institutions, cooperatives and other agencies.

b) Nurseries: Child care facilities are set up in the RDC and sometimes in several service area villages. Up to now, those outside the RDC were established on a temporary annual basis, with different villages selected each year. Permanent kindergartens with permanent teachers are now being planned for some of the RDC service area villages. In addition to providing pre-school education, nurseries play an important economic role by permitting mothers to leave the home and earn extra income.

c) Bookmobiles: Most social units have bookmobiles which distribute reading material to area villages.

d) Home economics courses: Sewing, knitting and cooking classes are offered in the centers themselves on a rotational basis to area villages.

e) Mobile cinema: A mobile film projection unit is used to show films in area villages.

3.1.3 Employment and Training: Rug-, Carpet-Weaving and Sweater-Making: Four of the RDCs have carpet-weaving units, and two of these have rug-weaving facilities as well. Two five-month training rounds are offered annually. Production units generate income for girls working in the units as well as for the social unit as a whole. In 1976 training and production units for sweater-making were introduced. Three of the four visited RDC's had such units--Joubet Bourghal, Harran and Ifreen. Additionally, units were established in two villages 15 and 12 km. from Ifreen. These programs are part of national efforts along such lines in which major emphasis has up to now been given to carpet-weaving. Approximately 100 carpet-weaving units now exist all over Syria.

The goals of the national program are:

- 1) to provide employment and income earning opportunities to rural inhabitants;
- 2) to discourage rural-urban migration; and
- 3) to stimulate regional development through increased demand for locally produced raw materials.



Nationwide, the carpet-weaving program trained and employed a total of 2,173 females in 1977,\* 184 of these women being in RDC-attached units. Average income was reportedly 200-250 S.L. per month and could reach a maximum of 350 S.L. for those who worked every day. Where other income earning alternatives are scarce or highly seasonal, the program may provide a significant source of supplemental family income. Absenteeism has been a chronic problem, however, peaking in conjunction with seasonal agricultural labor demand periods. This indicates that income levels for those who work in these units are too low to compete with other economic opportunities. For many areas where labor shortages seem to be a greater problem than unemployment, the contribution of such units is less than desired.

As a deterrent to urban migration, the program's impact can be considered to be negligible both because of its limited scale and because of the fact that incomes are not competitive with wages in the urban sector. Furthermore, those targeted as participants--young females--are not the ones most likely to move to town in the first place. As Williams indicates, the rural residents most likely to migrate are young men between the ages of 15 and 39.

In terms of the regional and national development linkages, proposals have been made to build State dye and yarn factories to supply the production units, including those in the RDCs. Since demand for carpets and rugs outstrips supply, the program could enhance demand for State sector products, especially if measures could be taken to improve productivity. The limited nature of the present program has meant that linkages into the economy have not been great. However, in locating other units and factories, more direct attention will have to be given to the availability of raw materials (cotton and wool) in order to maximize linkages to local producers.

The quality of the goods produced and the productivity\*\* of those who work in such units, however, are limited by the maladjustment of carpet-weaving to the social reality of rural women:

- a) high absenteeism coincides with peak agricultural labor demand periods (see Section 3.3);
- b) girls quit the program upon marriage when they have reached the peak of their skills, leaving behind a pool of beginners;
- c) looms are too unwieldy to be introduced into the homes of girls once they are married, nullifying potential long-term private income benefits of training.

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\*These are averages calculated by the Ministry of Labor and Social Affairs on the basis of the number of workers in each center during each month of the year.

\*\*Productivity is low, averaging 3,000 knots per day per worker, versus 15,000-20,000 in the case of Iranian weavers.

More emphasis should perhaps be shifted to sweater-making programs since looms are both compact and inexpensive;\* transfer of training benefits to the homes of married trainees is thereby facilitated. The same advantages may exist in rug- (versus carpet-) weaving as well.

Generally, programs aimed at women could benefit from more explicit support for ultimate home-based production by trainees. The benefits from acquiring the weaving skills would thereby be transferable to the home for more long-term benefits. At the same time, moving the program in this direction would complicate input supply and marketing problems.

Where they exist, RDCs could become more involved in such organizational activities while in others village cooperatives might be well placed to perform these supply and marketing functions. The Peasants' Union (and therefore the cooperatives) has in fact become increasingly involved in the carpet-weaving activities. However, they are apparently not moving consciously toward a system of scattered home-based production.

Despite these problems, RDCs do benefit from carpet and rug sales as a source of internally generated financing.

3.1.4 Agricultural Units: These serve in an extension capacity by:

- 1) The use of demonstration plots. Farmers who agree to set aside some of their land for this purpose are given all inputs free of charge.
- 2) Publishing and disseminating instructive materials on various aspects of crop production.
- 3) Making spot checks in the service area, and upon discovery of plant diseases or other problems arrange for herbicide or insecticide application. Special concern is given to industrial crops such as cotton and sugar beets.
- 4) Distributing fruit tree and olive saplings to further government aims to expand the cultivated area devoted to such crops. The Nawa and Ifreen centers were especially active in this sphere, in both cases concentrating on the distribution of olive saplings. Those planting olives are provided with technical supervision for the first 4 years of growth. The head of the agricultural unit in Nawa claimed that this effort was responsible for the planting of 900 dunams of olives over the last 15 years.

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\*Machines were estimated to cost 2,000 S.L. With earnings averaging at 500 S.L. per month (based on productivity), the price is equivalent to about four month's pay.

- 5) Conducting field tests for newly introduced crops or assessing the selective adaptability of new varieties to particular local conditions. In Harran al-Awamid, a field test of wheat was being conducted in cooperation with ICARDA, with another in Ifreen devoted to sugar beets.
- 6) Providing veterinary services. The staff of these units consists of between 1 and 3 agricultural engineers, 1-4 agricultural assistants, 0-1 veterinarians and 0-2 veterinary assistants. Agricultural and veterinary assistants are graduates of agricultural secondary schools, while engineers and veterinarians are university graduates. Of the 4 centers visited, only Nawa had a veterinarian working in the unit (see Manzardo, 1979).

3.1.5 Administrative Organization: General authority over the centers rests with the Ministry of Labor and Social Affairs which has a special directorate of RDCs. The Ministry of Labor and Social Affairs heads the Higher Council for Rural Development Centers, while at the centers themselves, the position of director is filled by an official from the same ministry, usually a graduate in law or social services. While the RDC director and the Ministry of Labor and Social Affairs are responsible for the social and educational unit, the health, agricultural and construction units are tied to the Ministries of Health, Agriculture and Construction, respectively. If, for example, some problem arises in the health unit, the normal procedure is to attempt first to settle this problem within the center itself, possibly during one of the bi-weekly meetings of the administrative council. If the issue remains unresolved, the Ministry of Health, and not Labor and Social Affairs is called upon. Such a procedure is used in the case of other ministerial responsibilities as well.

In addition to the involvement of regular ministries in the administration of the centers' activities, there has been a growing tendency to introduce other organizations also generally active in rural development. The Peasants' Union has been incorporated into decision-making at the provincial and district levels and directives have been issued to admit this organization and the General Federation of Women into deliberations held by the centers' administrative councils. This is potentially a healthy development, particularly given the organizational infrastructure represented by the over 3,000 cooperatives associated with the Peasants' Union nationwide.

Planning, budgeting and financing responsibilities are also divided among a number of Ministries. While coordination and planning are in the hands of the Ministry of Labor and Social Affairs in Damascus, finance and management fall within the domain of the Ministry of Administration and Local Affairs at the Mohafaza level.



ADMINISTRATIVE ORGANIZATION

LEVEL

Higher Council for  
Rural Development Centers

National  
Level

Ministry of Labor and  
Social Affairs (Head)

Deputy Minister of Health	Deputy Minister of Agri- culture	Deputy Minister of Housing	Deputy Minister of Finance	Deputy Minister of Culture and Guidance
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MOHAFAZA RDC COUNCIL

Mohafaza  
Level

Director of Health	Director of Agri- culture	Director of Housing	Director of Finance	Director of Culture and Guidance
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ALSO: Provincial Representative  
of Peasant's Union

DISTRICT RDC STEERING COMMITTEE

Mantika  
Level  
(of Center)

- Mantika Governor
- Nahia Governor
- Director of Center
- Teacher from highest level school
- Village and Peasant's Union Representatives

Nahia  
Level

RDC ADMINISTRATIVE COUNCIL

Centers

Director of Center

Head of Health Unit	Head of Agricul- ture Unit	Head of Construc- tion Unit	Head of Social and Education Unit (Director)
Ministry of Health	Ministry of Agri- culture	Ministry of Con- struction	Ministry of Labor and Social Affairs



According to a 1973 report written by a former RDC Director,\* shortage of funds has plagued the RDCs from the outset. At best, he observed, no more than 15 percent of the annual provisional budget has ever been actually allotted. While other obstacles have also hindered the ability of the Centers to serve the intended 40-50,000 people, funding problems have restricted their effective coverage to less than 2,000 persons per Center. Resource limitations have been especially debilitating in limiting the purchase and upkeep of vehicles which are critical if the centers are to extend effectively into the service area.

An additional problem has been the excessive diversion of funds to a swelled service and administrative staff, leaving less funds than might otherwise have been available for direct service and technical personnel and activities. One step in the right direction has been to substitute a simplified monthly statistical report form to be submitted to the Damascus Center in place of a complex system of record keeping. A more serious and intractable problem raised by shortage of funds is that of providing financial and other incentives necessary to hold technical staff, particularly doctors and agricultural engineers. The more isolated centers--those most in need of services--suffer most from this problem.

The Ministry of Labor and Social Affairs provides limited special allowances weighted in favor of the poorer Centers in addition to covering administrative costs and expenses incurred by social units in all the Centers. One positive development has been the expansion of internal money-gathering activities within the Centers themselves--the expansion of carpet-weaving and sweater-making, training and production activities which generate income through sales while providing supplemental income to girls working in the units. Agricultural produce from test fields also provides income to the Centers. Specialized units--health and agriculture--are financed separately by their respective ministries.

The problem of coordination and that of duplication of activities already provided under other ministerial auspices have plagued the RDC scheme from its inception. One observer in the mid-1960s concluded that:

"...the Ministry of Social Affairs was not able to coordinate the work of the Ministries of Agriculture, Education and Health. Community development activities that were started often duplicated the functions of other Ministries" (Fort:9).

This view is echoed by the RDC director in his 1973 report. Coordination difficulties, he maintained, "...resulted in units attached to other ministries pursuing independent activities, especially in

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\*Director of Rural Development Centers, "Report on the Situation of Rural Development Centers," 1973 (Arabic). Unpublished Report.

the Agriculture and Health Units." The Third and Fourth Five-Year Plans call for formalizing the separation of RDC units and associating them more closely to their parent ministries.\* Nevertheless, decisions reached in 1971 by the Higher Council for Rural Development and agreed to by the State Planning Commission (Letter No. 6929 8-10 1971) are still in effect; namely, that the Ministry of Social Affairs and Labor should maintain overall administrative authority while technically units would be connected to concerned ministries. There are some observers--for example, a conference of health inspectors--who still argue for a return to unified technical and administrative coordination of the centers under the Ministry of Social Affairs and Labor.

The coordination problem percolates all the way down to the day-to-day operation of the Centers. Relations between the directors and technical staff (i.e., the doctors, agricultural engineers, etc.) are, according to several informants marked by the classic tension between the generalist (i.e., the Director) and his technical employees who are not even directly responsible to him or the ministry he represents. Tensions are also exacerbated by the income differentials, especially between the rest of the staff and the doctors whose work commitment to the Centers is confined to the morning hours and whose government salary is merely a supplement to income earned from private practice.

Coordination difficulties are endemic to rural and community development schemes in general, since the activities involved in an integrated approach of this sort necessarily cut across the functional division of labor established at the national ministerial level. According to a recent review of community development efforts throughout the world, in countries where special community development agencies were established, such agencies were typically beset by animosities which surfaced between them and traditional ministries like agriculture, health and education (Holdcroft:10). The conclusion of the study was that "there is wisdom in trying to work with traditional ministries (Holdcroft:21).

Even though efforts were made to work through traditional ministries in the RDC program, inter-ministerial friction developed. Perhaps this friction emerged because the pre-eminent ministry, Social Affairs and Labor, lacked sufficient authority over units which maintained strong links to parent ministries. In contrast, in other development programs in Syria, authority vested in a rural development agency was strong enough, such as in the case of the Ghab and GADEB projects, problems of authority and coordination

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\*The objective as stated in the Fourth Five-Year Plan is: "To develop the existing regulations of village welfare centers (RDCs) in a way suited to the following services they provide: (1) social and family services, (2) rural crafts, and (3) kindergartens, and to transform the existing centers...after leaving health, agriculture and urbanistic services to other competent authorities" (Fourth Five-Year Plan, pp. 38-39).

have evidently not been as severe. Such models of authority and coordination should be studied for their applicability to RDCs in general.

From the brief overview I provided earlier of the mosaic of ministries and organizations involved in education and health delivery, it is clear that the coordination/duplication problem is a general one and not exclusively experienced in the RDCs. One might argue that where there exists a large sector of people who are not reached by basic services, performance of similar functions by different ministries and popular organizations but directed to different target populations is not an inherently negative phenomenon. Those agencies that have the infrastructure, organizational or otherwise, which reaches into the countryside--the cooperatives, the schools, even the mosques--are possible channels for service delivery. At early stages when even the most basic services are absent, an orthodox and neat division of labor may therefore not be the best way to get things done.

However, a problem does arise, as it did in the case of the RDCs when different ministries and organizations compete in the same terrain. In those areas increasingly well-provided for by Ministry of Health clinics and by Ministry of Agriculture offices at the Mantika level, it appears that the RDCs have been losing their authority and perhaps their effectiveness. For this and other reasons, the setting--physical, social and infrastructural--into which an RDC is to be introduced must be closely studied and monitored. Care should be taken to locate areas where such an approach could do the most good and reach the most people and then to have a flexibility built into it to perceive changing needs and re-adjust programs accordingly.

### 3.2 The Problem of Locating Centers

Centers are intended to serve populations of between 40-50,000 people\* living within a 20-km. radius. The use of population criteria is typical of location planning for other social service facilities as well. We see this in the Fourth Five-Year Plan which seeks to establish a hospital for every 40-50,000 people. These are to be built in mohafazat centers with clinics to be set up in nahia centers and "large" villages. Primary schools and electricity are to be provided to all villages with populations of 500 or more.

While such guidelines are useful for drawing up plans and budgets in ministerial planning offices, they must be supplemented by other types of information which affect the ability to achieve the basic aim of maximizing access to, and utilization of, such facilities in outlying communities. In particular, variations in population density, the scatter of settlements and the demand for services should be considered when adjusting population criteria, and more basically when determining whether the center approach is appropriate. Coexistence of a population of 50,000 within a 20-km. radius implies a minimum population density of 25-44 sq. km. The following table illustrates the implications of applying the established population and distance criteria for each of the Centers.

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\*When relevant, preference is given to the establishment of such centers in "poor" rural areas.



TABLE 37:

Center	Population Density in District (1970/km. <sup>2</sup> )	Estimate of Population within 20 km.	Radius for Population of 45,000
Harran al-Awamid*	--	--	--
Ifreen	58	72,848	15
Joubet Bourghal (Kirdaha)	92	115,552	12
Mayadin	4	5,024	60
Nawa (Izra)	54	67,824	16
Salkhad	17	21,352	29

\* No information available.

SOURCE: Prepared from 1970 Census data.

Centers located in areas of higher density--Ifreen and Joubet Bourghal--can potentially serve the intended numbers of people well within the 20-km. radius which, given adequate road connections, is a realistic standard. However, two additional dimensions must be considered in assessing the ability of RDCs to fulfill their mission: the scatter and modal size of settlements the RDCs are meant to serve. While loosely related to population density, those districts which are of equivalent population densities may nevertheless differ in the spatial distribution of their populations. Situations may range between those in which there are large, widely spread-out settlements to others where a large number of small villages exist in close proximity to each other. Each of these circumstances represents radically different service environments.

According to a UNICEF-sponsored survey of all RDCs in 1976, the total number of settlements served was 237, with a combined population of 172,714. The following table, Table 38, reflects the impact of population density and modal population size differences on the



**TABLE 38: NUMBER, POPULATION AND AVERAGE SIZE OF VILLAGES SERVED BY RURAL DEVELOPMENT CENTERS, 1976**

Center	No. of Villages	Population in Service Area	Average Village Size
Harran al-Awamid	43	39,035	908
Ifreen	41	30,454	743
Joubet Bourghal	105	30,971	295
Mayadin	6	19,088	3,181
Nawa	9	30,129	3,348
Salkhad	33	33,037	1,001

SOURCE: Adopted for data in, UNICEF report. (1977)

**TABLE 39: PERCENTAGE DISTRIBUTION OF VILLAGES AND TOWNS IN RDC DISTRICTS, BY POPULATION SIZE GROUP, 1970**

Center	Population Size Group			
	Fewer than 500 (%)	More than 500 (%)	More than 1,000 (%)	More than 2,000 (%)
Harran al-Awamid*	--	--	--	--
Ifreen	77	23	7	2
Joubet Bourghal	90	10	0	0
Mayadin	11	89	65	27
Nawa	10	90	50	40
Salkhad	40	60	24	6

\*No information available. Prepared from 1970 Census data

number of communities to which each RDC is supposed to provide services. Table 39 depicts the percentage distribution of villages and towns in RDC districts by population group.

Mayadin and Nawa serve an area of rather large villages: 89-90 percent of the villages have populations above 500 and between 50 and 65 percent have over 1,000 inhabitants. Salkhad, Harran and Ifreen serve villages averaging between 800 and 1,000. Joubet Bourghal represents a case of extreme fragmentation in which 90 percent of villages have less than 500 people and in which Joubet, with less than 1,000 inhabitants, is the largest village in the Nahiya. Thus, in Mayadin, while low population densities present a distance problem in terms of the ability to reach a substantial number of people, large village size represents an alleviating factor. Relatively few road connections are needed to ensure the extension of services to other villages. Joubet, despite its high density and shorter distances between villages, confronts difficulties posed by a structure of small, dispersed villages requiring an intricate road network to link them all together. This problem is exacerbated by the rough mountainous terrain in Joubet.

There is yet another respect in which village size acquires importance--the relationship between population size and adequacy or availability of services like schools, medical facilities and roads. While RDCs are designed to correct deficiencies in these areas, the ability to perform this mission is affected by the pre-existence of such infrastructure.

Settlement size has influenced the availability of non-RDC service infrastructure in the areas in which the six RDCs are located. Table 40 shows the quality of road connections between each center and villages in the service area.

Comparing these data with the population data of Table 38, we see that the ranking of RDCs on this quality of road dimension coincides exactly with average village size in the respective service areas. It is precisely those centers which are in greatest need of adequate and intricate road connections, those where the villages are typically small, which are worst off in this respect. Using the measure of schools per village in the service area of each center as an indicator of relative school facility adequacy, the same pattern appears (See Table 41).

According to the 1978 statistics\* virtually every village in nahawi served by the six centers had at least one primary school. (Seven villages in Joubet and three in Salkhad have no primary school.) For the centers, existence of such schools with interested and committed teachers is critical for the ability to organize adult literacy courses. Villages lacking such features are unlikely candidates for such courses, even though these may be the very ones in greatest need.

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\*Unpublished statistics from Central Bureau of Statistics.

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TABLE 40:

Center	Percentage of Villages Linked to RDCs by Asphalt or Stabilized Road, 1976
Harran al-Awamid	56
Ifreen	27
Joubet Bourghal	21
Mayadin	83
Nawa	67
Salkhad	40

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SOURCE: UNICEF. Study of the Rural Development  
Centers and the Status of Employees Working  
in Them in the Syrian Arab Republic, Damascus,  
1977.

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TABLE 41: SCHOOLS PER VILLAGE IN RDC SERVICE AREAS

Center	Schools per Village
Harran al-Awamid	0.79
Ifreen	0.56
Joubet Bourghal	0.38
Mayadin	2.83
Nawa	2.00
Salkhad	1.59

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SOURCE: UNICEF. Study of the Rural Development Centers and the Status of Employees Working in Them in the Syrian Arab Republic; Damascus, 1977.

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Finally, as far as the relative availability of medical personnel is concerned, we find the ratio of population per doctor to be more favorable (i.e., smaller) in the case of areas where villages are typically larger. With one exception (Ifreen), RDCs ranked according to population per doctor show the same order as in the case of road and school availability. Proximity to Aleppo and the rapid growth of the Ifreen mantika center itself--which is now a town of almost 25,000--may be jointly responsible for this departure from the norm.

Presence of such facilities does more than contribute to the direct service activities of the RDCs. Adequacy of educational, health and other services also affects the ability of such centers to hold personnel in rural areas. This problem is especially serious in the case of medical personnel and one that is generalized to the overall distribution of medical manpower. Looking into the future, one report predicted that:

"there will be sufficient physician capability in the mohafazat centers and large/medium size towns to form the core necessary (but not sufficient) for a good basic health delivery system" (Family Health Care, Inc.: p.66).

However, it is unlikely that physicians would settle in rural areas on a permanent basis. The report cites the example of UNICEF-assisted programs to construct 50 health centers. As of May 1976, they could only be staffed at the 50-percent level. Yet compared to other developing countries, physicians in Syria seem more willing to settle and work in rural areas. This is partially due to the desire of some doctors to live and work in areas where they were raised (FHC: 62). Two of the RDCs which I visited--Nawa and Ifreen--had such long-term doctors. In other cases, doctors consisted of fresh medical graduates fulfilling their two-year post-medical-school rural service obligation.

Comparison of health unit performance demonstrates the impact of these factors. The two RDCs located near large cities, Harran al-Awamid near Damascus and Ifreen near Aleppo, far outstrip the other centers in the number of patients treated (see Table 42). Both centers surpass the other in terms of the number of RDC-based doctors as well as doctors not associated with the RDCs with their own private practices in the community.

While not perfectly correlated, the administrative hierarchy of Mohafaza center, mantika center and nahia center and village represent a descending order of population sizes. There have been conscious government efforts to concentrate services in centers above the nahia level and especially at the Mantika and Mohafaza center levels. This means that such centers, and especially the larger ones, are likely either now or in the future to be provided with basic health, educational and agricultural extension services (see Section 2 of this report).

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TABLE 42: NUMBER OF PATIENTS TREATED BY RURAL  
DEVELOPMENT CENTER CLINICS, 1977

<u>Center</u>	<u>Number of Patients</u>
Harran al-Awamid	18,497
Ifreen	19,597
Joubet Bourghal	4,454
Mayadin	7,588
Nawa	8,268
Salkhad	5,063
TOTAL	63,467

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SOURCE: S.A.R., Ministry of Social Affairs  
and Labor, The Annual Statistical  
Bulletin of the Ministry of Social  
Affairs and Labor, 1977 (Damascus,  
1978), p. 140.

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As already noted, while this coexistence of service delivery infrastructures may bolster the operational capabilities of RDCs, it also has meant that involvement of RDCs in some of these activities is irrelevant and a duplication of administrative energies.

In terms of the work of agricultural units, Ifreen as a mantika center has a Ministry of Agriculture extension office separate from the RDC. The head of the RDC agricultural unit shuttles between the RDC and the Ministry of Agriculture office which he also heads and employs six agricultural engineers serving the whole mantika. This contrasts with the situation in Harran al-Awamid, a nahia center. It is located close to Damascus, a 40-minute drive, and near to the Intermediate Agricultural Institute from which it acquires saplings for its fruit tree proliferation program. This last advantage is complementary in nature rather than representing duplication of effort. Unlike the Ifreen case, there is no contingent of agricultural engineers employed in a Ministry of Agriculture office. Such an office exists instead in Duma, a mantika center. The Director of the Ifreen RDC health unit also doubles as the district Ministry of Health representative.\*

These observations suggest that if the RDCs are to represent a significant and unique contribution of services, they should be located no higher than at the nahia center level. The dilemma of the RDC approach seems to boil down to the fact that they operate best in centers which are easy to reach and usually large because of infrastructural supports available--places where they are least needed. Yet those communities most in need of the type of services provided by RDCs tend to lack the infrastructure needed to link the often small isolated communities in the surrounding area.

### 3.3 The Impact of Scheduling and Program Appropriateness on Access to and Utilization of Services

Scheduling of service centers such as the RDCs affects the propensity of the local population to use services. Even if no formal charges exist, opportunity costs are likely to arise and are likely to vary for specific groups. In the case of rural residents to be served by RDCs, or even by formal educational and health institutions, it is how people's lives are structured by their involvement in agricultural production that assumes central importance. Labor shortage or surplus in the area, the seasonality and intensity of agricultural labor demand, opportunities for non-agricultural employment, and the age and sex selectivity of labor activities are critical in affecting participation in these programs and utilization of services during different seasons and even times of the day.\*\*

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\*In this same mantika there are three nahia center-based medical dispensaries located in Jenderes, Bulbul and Rajo, each with one doctor. The relatively large populations of these centers probably explain the presence of these facilities. Similarly in Nawa (Dar'a) clinics exist in two large villages, Jassem and Harra.

\*\*Observations which follow are based on interview with RDC Directors, the head of the RDC Directorate in the Ministry of Social Affairs and Labor in Damascus and on statistical data provided on utilization and participation rates for the various services and programs.



Literacy courses, carpet/rug weaving projects, use of health clinics and nurseries are among those programs sensitive to the work environment. The position of females in the labor force and the seasonality of demand for female labor have a great impact on carpet weaving participation and on the utilization of nurseries. During harvest seasons, nurseries experience dramatic rises in participation rates while sharp drops in attendance are recorded in the case of carpet weaving units. For both sexes, temporary drop-offs in literacy course participation occur during such peaks in labor demand.

Visits to health units also fluctuate. Several factors may operate to produce such variations, namely the uneven seasonal occurrence of disease and illness in specific areas and the possible absence of a doctor from the clinic for some period of time. Nevertheless, the fact that lows in visiting rates coincide with labor demand peaks in several RDCs suggests the saliency of the labor demand factor in producing variation. There are a number of reasons why this occurs.

Since health clinic hours are restricted throughout the year to the morning hours, a sickness in the family during harvest time or other peak labor periods is likely to result in income losses. Seeking care during clinic hours might mean that a family member is forced to take off from work to accompany the ill person to the clinic. The alternative, to seek private medical care later in the day, thrusts a direct cost onto the family. Consequently, it is reasonable to expect that many illnesses go unattended particularly among poor rural families who have the desire to obtain treatment but cannot absorb the direct and indirect costs of involved.

This situation could be alleviated by either adjusting clinic hours by providing additional evening hours during peak labor periods or perhaps by having doctors reverse their usual clinic schedule, holding private practices during the morning and requiring them to work in the public clinics during the afternoon or evening.

One can draw a distinction between demands for labor which are recurrent and seasonal (being based on land use patterns and the major crops grown in an area) and more fundamental changes in the structure of labor demand--for example, the building of new factories. While the first type of pressure may create fluctuations in utilization or participation, the second type of change can possibly undermine the entire viability of certain types of programs.

These differences are well illustrated in the case of the carpet and rug weaving units. Monthly statistics on the number of man-days worked in the over 100 carpet weaving units dramatically demonstrate the impact of harvest time labor demand peaks. Several units have had to close down during these periods. Table 43 and 44 and Figure 3 depict fluctuations experienced in the four RDC-connected units.



TABLE 43: MONTHLY DISTRIBUTION OF WORKERS IN RURAL DEVELOPMENT CENTER CARPET-WEAVING UNITS, 1977

Center	Months												General Average
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Ifreen	52	47	58	60	42	60	58	53	61	59	48	56	55
Joubet	38	41	41	36	34	29	29	38	22	8	8	8	28
Mayadin	29	29	24	24	18	19	44	33	33	17	18	28	36
Salkhad	98	89	86	91	92	68	84	88	50	50	50	60	76
TOTAL	217	206	209	211	186	176	215	212	166	134	124	152	184

SOURCE: Ministry of Labor and Social Affairs.

TABLE 44: MONTHLY DISTRIBUTION OF MAN-DAYS IN RURAL DEVELOPMENT CENTER CARPET-WEAVING UNITS, 1977

Center	Months												General Average
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Ifreen	1,182	914	1,295	1,234	979	1,323	1,183	1,203	978	1,504	770	1,312	1,156
Joubet	812	808	875	706	688	644	637	338	378	206	168	180	513
Mayadin	679	696	600	451	438	464	729	778	635	425	270	622	565
Salkhad	1,770	1,718	1,592	1,692	1,568	948	800	1,241	652	1,116	1,116	1,017	1,302
TOTAL	4,443	4,136	4,362	4,083	3,673	3,377	3,349	3,560	2,643	3,251	2,324	3,131	3,527

SOURCE: Ministry of Labor and Social Affairs

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FIGURE 3: MAN-DAYS/WORKERS PER MONTH\* IN RDC CARPET-WEAVING UNITS  
--MAYADIN, 1977



\*Standardized as a percentage of peak month.

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As an all-female program, one would expect the impact of labor demand on carpet weaving units to be most strongly manifested where the labor contribution of females is greatest in performing agricultural tasks, a proposition that indeed seems to be borne out by the data.\*

The two-trough pattern exhibited by the Mayadin unit in Deir-ez-zor (see Figure 3) is particularly striking. There, the first dip in labor participation probably reflects the importance of females in cotton planting, hoeing and weeding operations conducted during the months of April, May and June; and the second, their role in the harvest beginning in September and extending through November. In terms of cultivated area, cotton is the primary crop in the Deir-ez-zor mohafaza.\*\* Wheat and barley cultivation, second and third in importance, probably have a more limited impact due to greater levels of mechanization and reliance on male versus female labor. In contrast, tomato growing, which ranks fifth in cultivated area, probably does attract away women during the long growing season which lasts from April or May to December.

Working in the Joubet Bourghal unit falls off dramatically in August/September and remains low through December. This decline mirrors the heavy involvement of females in olive, apple and cherry picking (mainly during October, November and December), combined with the absence during most of the year of many work-age males employed in the town of Lattakia or elsewhere, thereby increasing the burden on females left behind (see Figure 4).

In Salkhad there are two low periods, one in June/July with the second, a more precipitous drop, beginning in September and lasting until December. For the mohafaza of Sweida as a whole the major crops are, in order of importance, grapes, watermelon, wheat, tomatoes and apples. The June/July decline may be associated with tomato growing, the wheat harvest and the beginning of the apple harvest in July; the sharper drop in September coincides with the grape, watermelon and apple harvests (see Figure 5).

Finally, turning to Ifreen, fluctuations are much more evenly distributed over the year, and a generally higher level of labor participation is maintained than in the other units (see Figure 6). These special characteristics may be attributed to two factors: (1) the wide variety of crops grown in this mantika of Aleppo\*\*\*,

---

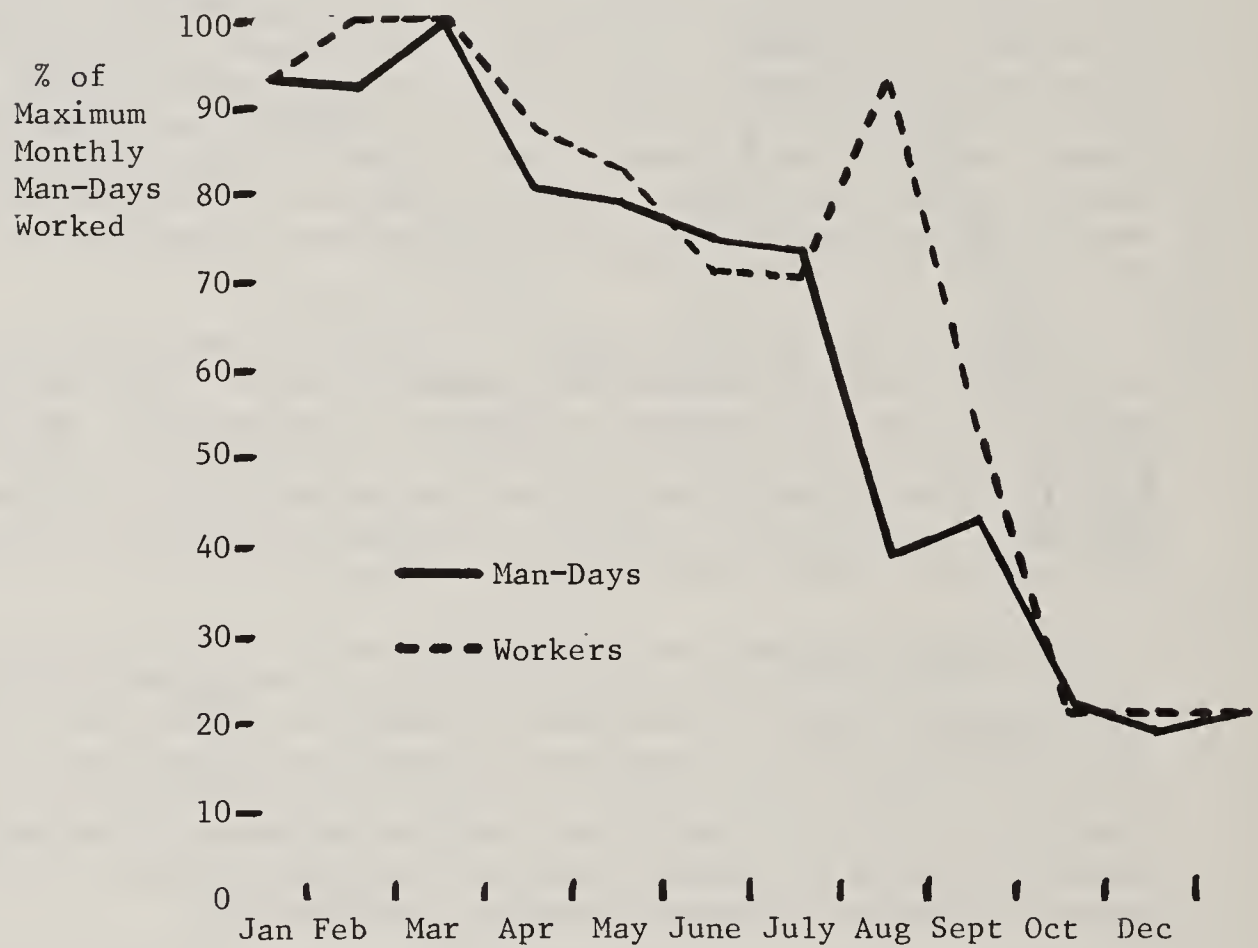
\*Monthly labor participation is measured by man-days and average number of workers per month. Where differences between the two measures are large, data for those months may be suspect. Figures 3 to 6 are based on data in Tables 43 and 44.

\*\* Information on relative importance of crops at the mohafaza level comes from Dr. Lester Schmid's report.

\*\*\*For the mohafaza, crops are in order of importance: olives, cotton, wheat, barley, watermelon, lentils, grapes, musk melon.

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FIGURE 4: MAN-DAYS/WORKERS PER MONTH\* IN RDC CARPET-WEAVING UNITS  
--JOUBET BOURGHAL, 1977

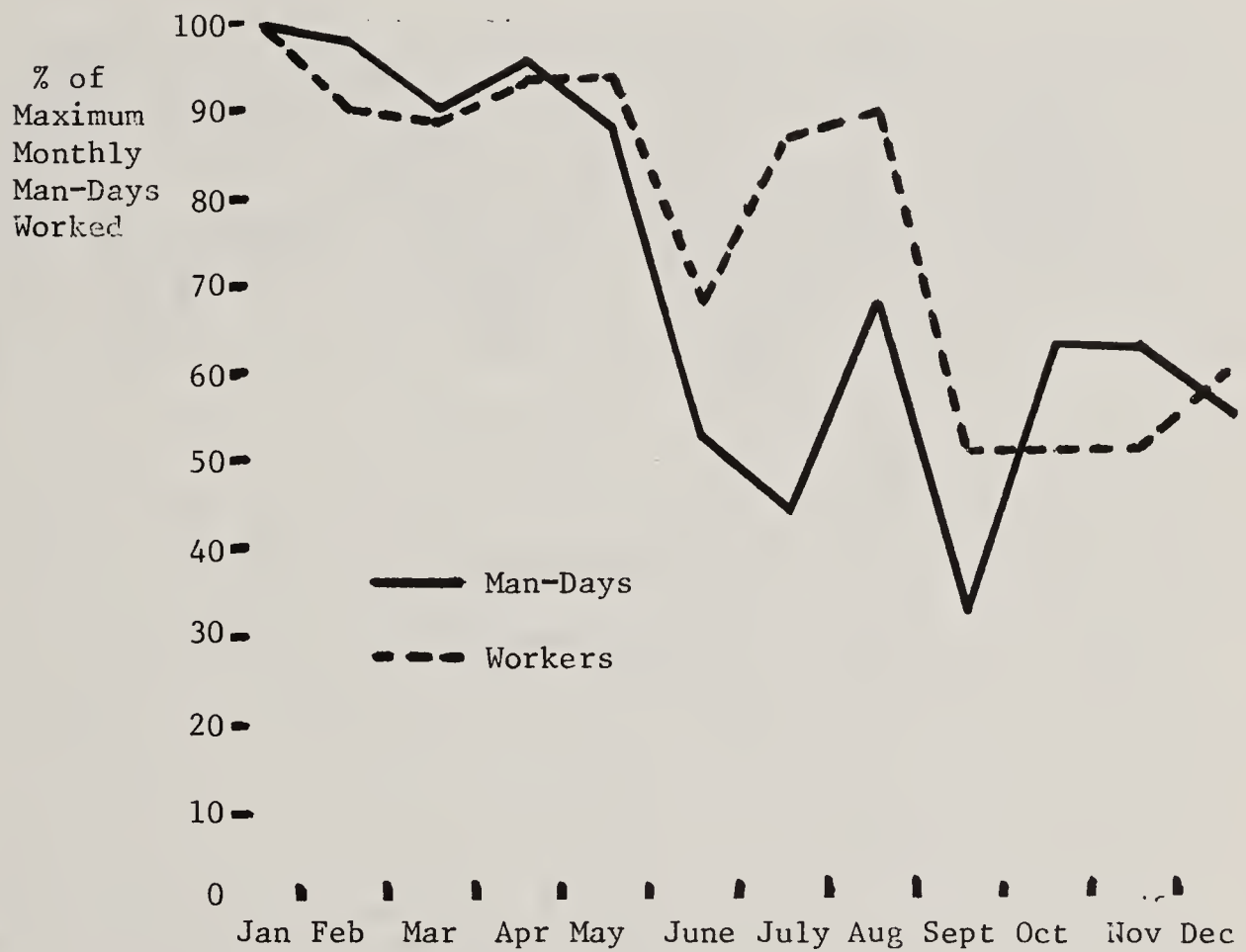


\*Standardized as a percentage of peak month.

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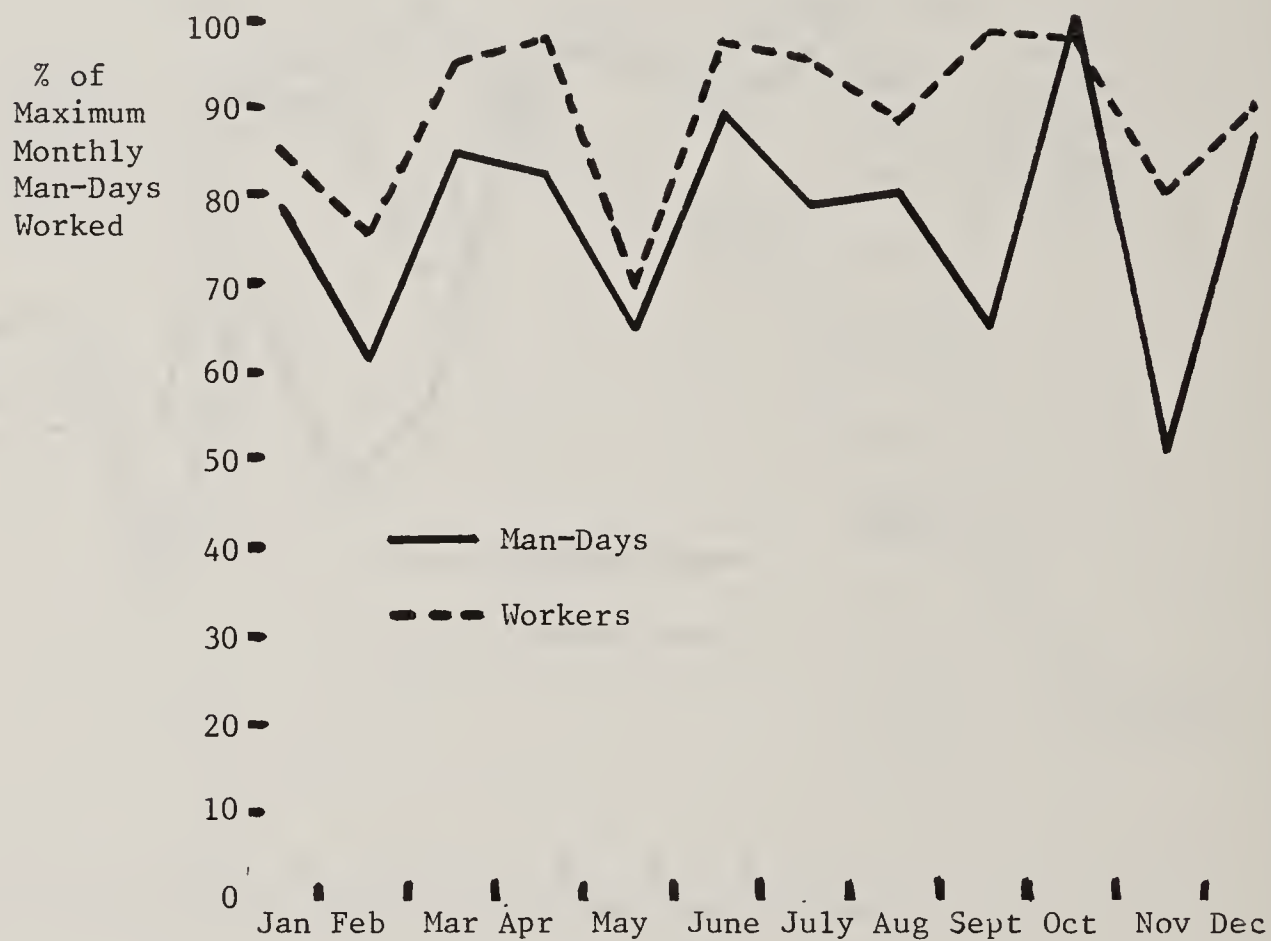


FIGURE 5: MAN-DAYS/WORKERS PER MONTH\* IN RDC CARPET-WEAVING UNITS  
--SALKHAD, 1977



\*Standardized as a percentage of peak month.

FIGURE 6: MAN-DAYS/WORKERS PER MONTH\* IN RDC CARPET-WEAVING UNITS  
--IFREEN, 1977



\* Standardized as a percentage of peak month.

and (2) the fact that Ifreen itself has grown into a sizable town (population estimated to be 25,000) and that consequently agricultural labor demand pressures may be less than in other centers, and may perhaps be overshadowed by competition for labor within the urban sector itself. Ifreen's low point in May is probably a consequence of cotton (and perhaps watermelon) planting and tending activities; the low point occurring between July and September represents the joint impact of wheat and barley, watermelon and grape harvests, while that in November evidently results from involvement in olive and cotton harvesting activities. The fall-off in February remains unexplained.

Some units located near Damascus underwent dramatic and drastic fall-offs in participation for other reasons. One experienced a drop from 120 to 28 over a two-year period. Another case was reported in which construction of a shoe factory nearby forced closure of a unit. In both instances, higher wages offered in the factory or other work (picking fruit in the Ghouta, for example) attracted girls away from the carpet weaving unit. Withdrawal of World Food Program assistance in the form of sugar, tea and rice commodities to participants also undermined the attractiveness of joining such programs.

The lessons to be drawn from these experiences are clear. Before investments are made in rural areas, a careful feasibility study of how the proposed project fits into the existing structure of labor demand in the area is needed. This is especially critical for determining the best location for rural industrial development, whether this involves carpet weaving or other types of industry. For other basic services, such information may be incorporated into scheduling and programming decisions. Furthermore, if the intention is to encourage participation by the poorest segment of the rural population, special attention must be given to the way "it fits" into the local economic structure. For example, the place of young girls in agricultural production may determine the likelihood of their attending schools. This has been found to be especially salient in areas where labor-intensive crops like cotton and sugar beet are grown and in which dependence on female labor is great. Such considerations may be incorporated with other strictly economic ones in making up plans for agricultural mechanization for particular areas.

### 3.4 Overall Assessment of RDCs Role in Service Delivery

The assessment of the RDC model for social service delivery focuses on two questions:

- 1) the ability of RDCs to respond to local needs and delivery services under different conditions; and
- 2) the adequacy of services provided through the integrated multi-service framework of RDCs rather than through individual ministries.

3.4.1 Success of RDCs as a Community Development Approach: As an approach inspired by community development principles, RDCs can be judged by their success in strengthening the capacity to delineate local level needs and in providing a mechanism to mobilize government resources to meet them. Achievements have been limited to this respect. Growing involvement of Peasant Union representatives in the centers may eventually enhance the flow of communication from the bottom of the administrative hierarchy to the top. The Peasants' Union's (PU) connections at all levels with the Party and their representation on high-level inter-ministerial councils put them in a powerful position to marshal resources to meet local community needs. Their actual ability to do these things is now limited, however, because of the ambiguous role they are assigned to play: both to resist the bureaucracy while at the same time directing farmers to follow State plans.

3.4.2 Benefits of Integrating Delivery of Services in RDCs: Possible advantages from a unified RDC administrative framework have been largely nullified by coordination difficulties. Agriculture and health units in particular have tended to pursue independent policies. It has been at the lowest levels, within the centers themselves, that such conflicts surfaced most severely. Yet, these conflicts could only be resolved in Damascus.

A way to alleviate these problems is suggested by the Egyptian approach in what are the prototypes of the Syrian RDCs. While also under the authority of a single ministry, units in each RDC are linked to a super-ministerial council at the provincial level. All RDC employees are responsible to this council rather than to specific ministries. Also, budgetary and personnel decisions are all made at this lower administrative level which is closer to the RDCs and more sensitive to local conditions.

Establishment of a provincial level council similar to the type used in Egypt is presently being considered for the social and cultural centers set up in reclaimed area villages by GADEB. This organization would replace the present arrangement whereby centers have been directly linked to the Social Section of GADEB.

3.4.3 Ability of RDCs to Supply Services to the Intended Target Population of 40,000 Living within a 20-km. Radius of the Centers: Fort concluded in the 1960s that the RDC approach could work only in areas of high population density (like the Delta in Egypt), but that in Syria they were "ill-suited because distances between settlements tended to be too great and villagers were not likely to travel a great distance to get help from such centers" (Fort:10).

While population density is indeed highly significant in determining the suitability and performance of RDCs, two additional factors are also important: average village size, and topographical conditions in the service area. The ranking of RDCs by infrastructural and basic service quality (of roads and schools) was found to coincide exactly with their ranking by average village population



in their respective service areas. Relative availability of medical personnel followed the same pattern, though not identically. Proximity to Damascus and Aleppo lifted two RDCs above the rank that could be expected if reference had only been made to the average village size variable.

Using a rough typology of operating conditions based on two dimensions, population density and average population of area villages, the following conclusions are suggested concerning the relative appropriateness of the RDC approach under the four sets of conditions summarized in Figure 7.

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FIGURE 7: Typology of Villages for Designing RDCs

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	Average Village Population Size in Service Area		
		Large	Small
Village Population Density	High	1	2
	Low	3	4

---

Type 1: High Density / Large Villages. While RDCs might function well under these circumstances, little unique contribution could be expected from them in their present form. It would be preferable to emphasize mantika and nahia administrative systems for the delivery of services. Existing administrative unit areas could be subdivided if they were too large to be served by the preexisting service centers.\* Higher level, more specialized services facilities (for health and education) could be distributed to centers on an area-wide basis rather than, for example, placing them all within every mantika center (e.g., a secondary agricultural school in one center, a secondary industrial school in another, etc.).

Type 2: High Density / Small Villages. RDCs would be useful under these circumstances because of the probable absence of basic services in many villages. But the ability to extend services is hindered by the need for intricate road connections between villages and the center. Mountainous or muddy terrain conditions aggravate this problem. Special resources would have to be devoted to transportation.

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\*Between 1970 and 1977, a large number of nawahi have in fact been subdivided.

Type 3: Low Density / Large Villages. RDCs can potentially operate well under these conditions. But since some of the largest villages in such areas are already likely to have health clinics, agricultural extension services and schools, particularly the mantika centers, the unique contribution of RDCs would be questionable. If established, RDCs would better be limited to nahia centers or villages lacking administrative center status. Since in this type of area, villages are rather distant from each other, it might be advisable to concentrate the full range of facilities (e.g., small hospitals or intermediate institutes) in larger communities. Such a strategy contrasts with one for high density areas which distributes lower level service facilities on an area basis with centralized higher level facilities. Secondary vocational schools, agricultural, commercial and industrial schools might be built in single communities rather than assigning schools of each type to different villages or small towns. The area-wide approach under high-density conditions may not impair access, but such an approach would create access problems where settlements are widely spread apart.

Type 4: Low Density / Small Villages. These conditions are the least appropriate for introducing permanent RDCs in any one place. Development of small, mobile units operating out of base facilities in the larger urban centers would represent a better approach. This design would be especially practicable in arid, steppe areas where travel is less reliant on the existence of roads. More specialized services could be provided by periodic visits of combined multi-service teams. Market days could also be chosen to deliver services like health that can be provided on an intermittent basis.

In situations (2) and (4), developing a cadre of village-level rural development workers could provide a means to supply basic information and services on a more continuous basis to residents of isolated, small communities. This matter of personnel and the levels of specialization and training required under different circumstances merits elaboration.

3.4.4 Staff and Training Implications: Existence of rural development workers with a broad range of skills at different levels of specialization would permit a more flexible response to particular social service delivery needs than is presently the case.\* Recognizing this need, the Ministry of Social Affairs and Labor initiated some years ago a training program to produce rural development workers for its RDCs. Agricultural secondary school graduates were put through a six-month long course in Damascus and were then assigned to operate as village field workers with responsibilities to each of the RDC units. In this sense these individuals were to assume the role of an RDC in the villages to which they were sent. About 80 individuals graduated before the courses were discontinued. Most centers no longer employ such agents. The only exception I observed was in Nawa which had two, each based in a village while serving other communities in the immediately surrounding area.

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\*In agricultural extension work, in many countries, training is area- and crop-specific.

Factors undermining this program were:

- (1) After being employed for several years, field workers came to realize that they were in a dead-end position: advancement was impossible within their area of specialty and they were unable to transfer their training to other jobs; and
- (2) The prospect of long-term residence in rural areas often lacking in basic services like schools was a hardship for agents with families.

GADEB presently provides general social services and rural development training through the Land Use and Development Branch of the Rakka Intermediate Institute of Land Reclamation. About 50 people are graduated annually as specialists in agricultural production and social development. They work in the cultural and social centers built in reclaimed area villages and in the socio-economic studies section of GADEB. Special training in socio-economic development is offered in association with training in other skills which provides the graduates with more job flexibility than those who emerged from the Ministry of Labor program.\*

A revived effort to produce village level rural development workers in other ministries, especially in the MAAR, could avoid some of the past difficulties by giving such workers special training in social development, something similar to that offered by GADEB. Such a program could also limit the duration of direct fieldwork and offer additional training or educational possibilities once the village service stint was completed. Candidates could be chosen who were single or newly married without children to reduce hardships. Village residents with some education could also be selected to be put through special courses. In Afghanistan this has been done to train village health care workers (Traditional Health:8).

### 3.5 Conclusion

The unique potential of the RDC idea lies mainly in the fact that such centers physically and administratively bring together a mix of disparate rural development related programs and services. Coordination difficulties weaken this potentially integrating feature, but other experiences indicate that there are ways to reduce such problems. Their greatest contribution, however, might be to provide a forum at the local level where information can be shared among people involved in health, literacy, agricultural extension and sweater-making activities. Literacy could reinforce health education and agricultural extension activities by introducing information from these areas into the reading material prepared for courses.

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\*To date, graduates from this program have been assured employment with GADEB, which might have to restrict such opportunities in the future.

Agricultural extension agents could be made more aware of nutritional and disease problems associated with their work, such as how to minimize disease risks introduced by irrigation. Experience gained could be introduced into staff training for technicians and others working in rural areas, whether within or outside the framework of the RDCs. The RDC idea is a valid one which can be profitably used in appropriate circumstances. Much can be learned from past experiences in Syria concerning the location and organization of RDCs as well as other service centers under the direct supervision of ministries with rural social development as one of their goals.



#### 4. Toward a More Locally Adjusted Planning Process

This report began with an overview of how extension of social services to the country's rural residents was seen by the government to fit its broad development objectives. Yet, rural peoples' decisions to seek health care, to pursue education and whether or not to migrate are not directly subject to the government's control. Under present conditions, the government can only hope to structure such decisions, which are generally made within families. They strive to balance the more immediate goal of maximizing family income with the more distant one of securing a source of livelihood for sons with which they can eventually support their own families. Utilization of services, reliant as it is on client initiative and capabilities, reflects the operation of this family calculus. In the case of the RDCs it was shown that variation in carpet-weaving program participation and use of medical services was attributable to the costs of time spent participating or having to reach facilities. For rural families involved in agriculture, who lived in RDC service areas, the value of time required to participate in RDC programs varied significantly over the course of the year, particularly in association with seasonal fluctuations in labor demand.

Interest of the government has tended to be restricted to the aggregate outcome of family-level decisions and the degree to which they coincide with planning goals and targets drawn up for the whole country. However, since labor demand structure, settlement patterns and other contextual elements differ so markedly across the country, policy effectiveness could be enhanced by tailoring programs and delivery systems more closely in accordance with local conditions. This tailoring would involve defining problems and needs and devising appropriate location strategies for facilities and personnel, for training of personnel and for scheduling in a differentiated location-specific manner.

To formulate and implement policy in a more locally adjusted way, information about potential service areas relevant to social service planning must be identified and generated. Information must then be channeled to those at administrative and political levels vested with authority to incorporate this information into programming and resource allocation decisions affecting particular areas.

A significant step to provide the necessary administrative machinery for more locally adjusted planning came with the establishment of the Ministry of Local Administration in 1971 (by Legislative Decree no. 36). As noted by Averell (see his report), this and other new laws have provided the framework for the transfer of power from the central level down to the local councils at the Mohafaza, Mantika and Nahia levels. Potentially at least, this restructuring means that people most familiar with local conditions have more of a say in determining policy. And in fact, such councils have acquired increased authority in deciding matters

like the location of service facilities and resource allocation to communities under their jurisdiction. These changes are, however, not designed to displace the system of national central planning in which primary authority is concentrated at the highest political and administrative levels. Instead, local councils act as conduits of an improved information base for national planning. Aggregate national targets, aims and criteria are, or could be, elaborated with more specific programs and implementation strategies for different areas.

To reduce some of the information load placed on communication channels between lower administrative and the national administrative and planning levels, it would be advantageous to have areas of the country distinguished by criteria which broadly relate to social service planning. A stable framework would thereby be provided within which the finer details of finance and location could be elaborated. Population size criteria have been resorted to for this purpose; but, as we have seen, reliance on this measure alone ignores other factors that affect social service delivery, program relevance and participation and service utilization levels. At the same time, the amount and variety of information to be incorporated into social service planning must be limited if an "information overload" is to be avoided.

A possible path between these two pitfalls is to distinguish geographic areas of the country by agro-ecological conditions, such as availability and source of water, topography and soil quality. Such conditions impinge on virtually every aspect of social service planning. As part of the Agricultural Sector Assessment, 53 relatively homogeneous agro-ecological zones or Resource Planning Units have been identified. Their relevance as potential social service planning units is suggested by the link shown to exist in the RDC case between agro-ecological conditions and: (1) indirect costs of service utilization and program participation; (2) settlement patterns and therefore the facility location/access issue; and (3) local manifestation of particular types of problems and needs.

(1) Agro-ecological conditions have a direct link to the indirect costs of service utilization and program participation. Such conditions define land use possibilities and can, therefore, be expected to affect the intensity and seasonality of labor demand. For rural families the labor demand situation can determine indirect costs or income losses incurred because of time spent obtaining services or participating in literacy or other training programs. Such time spent in obtaining services cuts into time which could be generating income.

(2) Agro-ecological conditions also affect settlement patterns. The clustering of settlements along rivers or in oases is common in Syria. Highly fertile land enables the settlement of a more numerous population. Other factors also affect settlement patterns, of course, but a certain correlation with agro-ecological

conditions undoubtedly exists. Such a correlation can provide guidance in devising more area-specific social service delivery strategies designed to maximize access. The delivery problem is obviously different in cases of large villages located close to each other or to large towns, widely scattered villages, or semi- or completely nomadic social formations (see Appendix I)

(3) Agro-ecological conditions also help to determine the types of problems with which social service delivery systems have to contend. A recent study of health conditions and services makes the point that "health problems cannot be isolated from the physical and cultural environment in which they occur" (Syncrisis, pp. 19-20). An illustration of how this position is upheld in the case of the Bedouin is worth quoting in full:

There are special health problems which are directly related to the nomadic lifestyle which adversely affect the nomads as well as the people with whom they come into contact. A number of infectious diseases, including cerebrospinal meningitis and measles, are contracted and disseminated by the nomads in their wanderings. Mosquitoes carried by the nomads aid in the spread of malaria, while the snails which are the hosts for schistosomiasis lodge in the hoofs of their cattle (Syncrisis, p. 21).

Similarly in desert areas, the dry winds and dust storms ". . . result in a high incidence of conjunctivitis"; water ponds created during the rainy season "provide breeding grounds for mosquitoes which increase the threat of malaria"; river irrigation canals in the Euphrates River Basin and its tributaries, the Balikh and Khabur, are ". . . major sources of schistosomiasis" (p. 19) and malaria (p. 38). (The debilitating effect of such water-borne diseases is especially grave given the high labor intensity of crops grown in such areas.)

The potential of agro-ecological zones (RPU's) for social service planning should be further explored. However, such a technique appears to offer benefits to the planner who wishes to make planning more adjusted to local conditions without having to overload the communication channels of the planning agency. The analysis of the RDCs presented in this report indicates that some such adaptation of social service planning is critical to avoid past errors and achieve the goals for which such systems are designed.



## Appendix I

An example of a plan which took agro-ecological conditions into account can be found in a social soundness analysis of rural water supply projects planned for three environmentally distinctive locations in Deir-ez-zor and Al-Hasakeh provinces: (1) the Euphrates Valley area, where settlements are concentrated in a band along the river; (2) the semi-arid Jarawan Plateau, sparsely populated with scattered villages; and (3) the Sharki-Kokab Plains, occupied in a compact pattern of small villages and sub-village units (mezr'aa) separated by only small distances.

The more highly concentrated settlement structure in the Sharki-Kokab Plain is considered likely to increase the number of indirect project beneficiaries since it places so many more people within physical access distance to facilities to be constructed. Each of these areas also exhibits distinct migration patterns, which are linked to the types of crops grown, the levels of dependence on sheep and goat herding and therefore labor demand and income potentially obtainable from agriculture.

Conditions in each area also correspond with transportation quality, a critical factor in providing health and other services to residents. Little problem existed in the band of mostly large settlements along the river which could be linked together by relatively few road connections. Under these conditions, it was felt that either fixed facilities or mobile units could provide adequate services. On the Jarawan Plateau, while there were few paved roads, dry conditions permitted year-round travel. In contrast, higher precipitation and inadequate drainage in the Sharki-Kokab Plains hindered travel over unpaved areas:

. . . During the winter many villages are made inaccessible for up to three months. This constitutes a major problem for the inhabitants especially in cases of medical emergencies. (Asmon)

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Appendix II

TABLE 8: Availability of Water, Sewage and Electric Services  
Among Survey Villages (N=103)

Service	N	%
Water Piped to the Homes in the Village	19	18%
Water Supplied to the Village Center	29	20%
Sewage System for the Village	8	8%
Electricity Available	34	33%

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# Syria: Agricultural Sector Assessment

## Volume 5: Human Resources and Agricultural Institutions Annex

### CHAPTER VII

#### NUTRITION

By

Dean Wilson and M. Salameh

#### TABLE OF CONTENTS

	<u>Page</u>
1. Introduction -- Nutrition Assessment and the Five Year Plan	1
Agricultural Production	1
Health and Sanitation Programs	2
Food Storage and Preservation	2
Food Subsidies and School Lunch Programs	2
2. The Assessment of Nutritional Status	2
Measurement of Nutritional Status	2
Health Status, Infectious Diseases and Sanitary Environment	4
Food Balance Sheets for Syria	4
Nutrient Consumption - Family Level	6
Analysis of Nutrient Demand	8
3. The Price of Nutrients	10
4. Traditional Syrian Diets	12
5. Recommendations	12
Appendices	19



## 1 Introduction--Nutrition Assessment and the Five Year Plan

The purpose of this nutrition assessment is to provide information and recommendations as background material for 1980-85 Five Year Plan.

The 1980-85 Five Year Plan (the 5th Five Year Plan for Syria) could be the first such plan to explicitly state a national food and nutrition policy for Syria. Previous plans have had as "general aims":

- a) to achieve self-sufficiency of main foodstuffs, and
- b) to raise the food standard in particular respect to animal and high-class foodstuffs.

It is possible to achieve the above "general aims" and still have serious malnourishment among members of the Syrian society.

Each of the past Five Year Plans has had stated aims, goals, and programs which interact in important ways with the nutritional status of the Syrian population and certainly, the programs resulting from the 1980-85 Plan will also interact significantly with nutritional status.

Some examples of the programs in the Five Year Plans which interact with nutritional status are:

### 1.1 Agricultural Production

Generally, increases in agricultural food production result in increases in nutrients (proteins, calories, minerals, vitamins, etc.) and, if these increases lead to greater consumption by the population, the expectation is improved nutrition for the population. However, negative effects of agricultural production on nutritional status of the population could occur. For example, if the agricultural increases are achieved by increasing the lands irrigated with water containing raw sewage,\* gastro-intestinal diseases can reduce the expected nutritional gains.

The 1980-85 Plan is expected to have as a goal to increase the animal production in Syria. The general nutritional effect of such a program is to increase the quality of the protein (generally, meat products have a better amino acid balance than other foods), but the program may reduce the overall quantity of nutrients available to people. This is especially the case if animals are fed food suitable for human consumption, or, if land is diverted from the production of food for human consumption to the production of food for animal consumption. The effect of increasing animal production could be to lower the nutritional status of the Syrian population below expectations.

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\*All of the irrigated lands around Damascus are said to be irrigated with water containing untreated sewage.

### 1.2 Health and Sanitation Programs

Health and sanitation programs, which have as their objective to reduce the gastro-intestinal tract diseases and other infectious diseases (the diseases which are responsible for the high infant mortality rate in Syria), will have their impact upon nutritional status of Syrians by permitting the body to better assimilate the nutrients consumed and to allocate the assimilated nutrients to bodily growth.

The public utilities and housing programs to increase the number of beneficiaries of clean drinking water and to create treatment stations and sewer networks (1975-80 Plan) are also expected to improve nutritional status of the Syrians.

### 1.3 Food Storage and Preservation

Food storage and preservation programs will increase nutrient availability for consumption and thus would be expected to improve nutritional status.

### 1.4 Food Subsidies and School Lunch Programs

Such programs allow the poorer segments of the Syrian society to compete more equally with the richer segments for the available nutrients. These programs are expected to improve nutritional status. The effect on nutritional status may not be all positive; to fix the price of a commodity low without rationing could possibly lead to large wastages of the commodity by some segments of the society and thus reduce the overall availability of nutrients.

## 2 The Assessment of Nutritional Status

The nutrition assessment team consisted of two members, D. Wilson and M. Salameh (Syrian counterpart). The time for the assessment was limited to a five-week period in Syria in February and March 1979, and a three-week period in May 1979. In that amount of time, no primary data could be collected, so the study was limited to the data available from previous studies, from the Central Bureau of Statistics, and from interviews with the relevant Ministry personnel. From these sources the information was obtained which follows.

### 2.1 Measurement of Nutritional Status

Nutritional status is primarily measured by growth. Growth is most easily observed in children. Generally, in the nutrition assessment of countries, it is assumed that if the children of the country exhibit standard\* or better growth, the adults of the country are also well nourished. This correlation has been tested in several countries and has been found to be valid except for pregnant and lactating mothers.

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\*The most commonly used standard is the growth of children as has been measured in Boston or Iowa, U.S.A.



For Syria, we found very little data on growth of children. One study by the Ministry of Health covered 630 children from the rural areas around Damascus. These children were from 0-60 months' old. It was reported that after 6 months of age the rate of increase of mean weight of sampled children was not as rapid as the standard, and the sampled children's weight equaled 75 percent of the Boston mean weight in the period between 18 and 21 months. By the 60th month (five years of age), the mean height of the 630 children reached its lowest level (88 percent of the Boston mean height at the age of five years), but by the end of the 71st month, the growth in height recovered to the level of 91 percent of the Boston mean height. This study suggests that the critical age of children (in rural Damascus) is between 6 months and 2½ years.

In a study of malnourishment in 1974, reported in the same document,\* 773 children from rural and urban Damascus were investigated. Again, these children were from 0 to 60 months of age. This study showed that over 50 percent of the children suffered some degree of protein malnourishment and the most critical period was between 7 months and 2 years of age.

In another study, it was shown that the iron intake of sampled children remained below the iron requirement during and after the critical period (6 months to 2½ years), thus strongly suggesting a lack of protein from 6 months to 2½ years.

A health survey\*\* is being initiated in 1979. This survey, designed during 1978 and currently (May 1979) in the pre-test stage, is an excellent beginning for a nutrition surveillance system. The survey includes the following:

- 1) Height and weight measurements of children 0-60 months of age.
- 2) Five regions of Syria are to be covered on a sampled basis: North (Idleb), South (Sweida), East (Hassakeh), West (Lattakia), Central (Homs). One Mohafaza is randomly selected from each region each time the survey is repeated in the region. Seasonal variation (four different seasons) in data collection will help in the testing of hypotheses concerning the causes of malnourishment and associated diseases.
- 3) Urban-rural variations are designed into the sampling procedure.
- 4) The survey has been designed as a continuous survey to be repeated at two-month intervals throughout the year.

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\*Source: Quoted by Dr. Hisham Ghebeh and Dr. Khaled Madini, "Present Status of Child Health in Syria," Mimeo. Document prepared for the International Year of the Child, 1978, p. 7.

\*\*Design and implementation by the Ministry of Health, Dept. of Research and Statistics. See Appendix 2 for data from the pre-test of this survey.

- 5) The survey is at the household level of the community. This is a necessary condition for a nutrition surveillance system.

A preliminary tabulation of 250 pre-test questionnaires in the five Mohafazat (see Appendix 2) indicates that up to 20 percent of the children (ages 0-6) in these areas are not growing according to standard expectations. Although these data are only from a pre-test, they indicate that a malnutrition problem exists.

## 2.2 Health Status, Infectious Diseases and Sanitary Environment

As noted above, the team could make no direct assessment of the nutritional status of the Syrian population as a whole from measurements of growth. But, according to the theory of the causes of malnourishment, the growth of children in a population can be predicted from a knowledge of consumption of nutrients as well as the incidence of certain diseases (especially diarrhea and measles, and whooping cough). With this in mind, we collected morbidity and mortality data from the Central Bureau of Statistics (CBS).

We discovered in the CBS, however, that the morbidity and mortality data are possibly under-reported by 50 percent. Even in this case, perhaps we could assume that all mortality and morbidity were more or less equally under-reported for all age groups, which is of course a rather weak assumption. (The importance of the 1979 health survey by the Ministry of Health, Dept. of Research and Statistics, again comes to mind as a critical source of data for enabling analyses to implement a nutrition policy.)

Nevertheless, we found the highest mortality rate for the country as a whole to be for the young children. The causes of death were primarily diseases which the current theory classifies as nutrition-related diseases. Also, the morbidity data indicate a high incidence of nutrition-related diseases. See Appendix 1 for a presentation of these data on diseases.

We must be careful of the conclusion that is drawn here, but the available data (morbidity and mortality) can be taken as a warning flag that when the results of the nutrition and health survey begin to be available, some areas of the country may well indicate a relatively serious malnourishment problem.

## 2.3 Food Balance Sheets for Syria

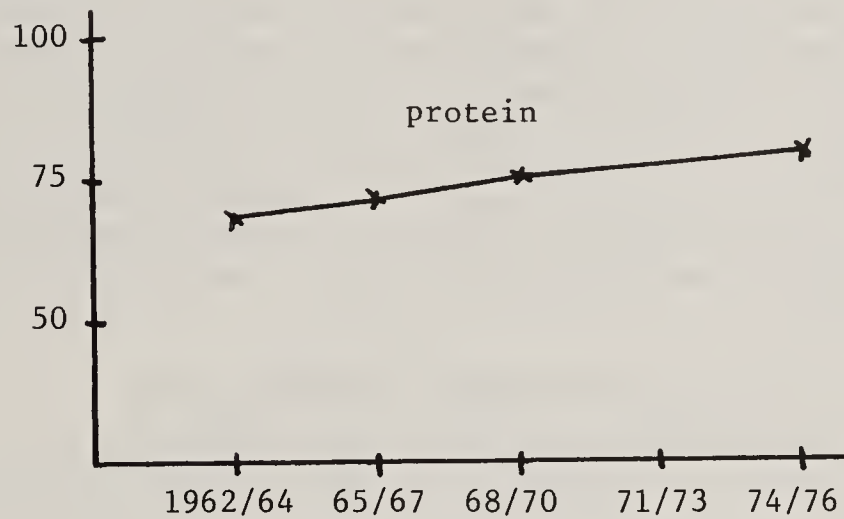
The assessment team found that Food Balance Sheets\* for Syria have been calculated since 1962. This work appears to have been well done. A food balance sheet estimates the availability of nutrients in the market place for the population. Since 1962, the food balance sheets for Syria can be summarized as follows in Figure 1:

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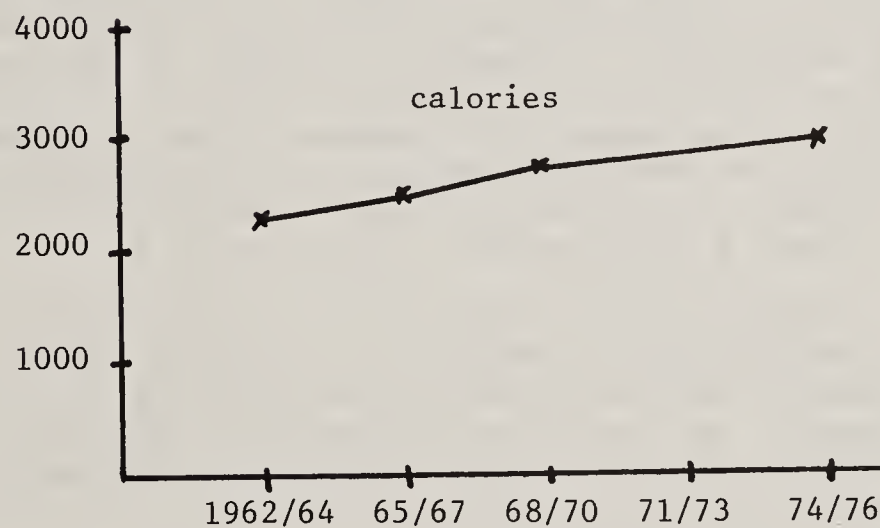
\*Prepared by Directorates of Technical Affairs and Research, Ministry of Supply and Home Trade.

FIGURE 1: Results from Food Balance Sheets, 1962-1976\*

Protein grams/  
person per day



Meal/person  
per day



\*Prepared by Directorates of Technical Affairs and Research,  
Ministry of Supply and Home Trade.

A conclusion one can draw from these graphs is that agricultural policy, foreign trade policy, and the food storage and transport programs are generally capable of delivering sufficient nutrients to the market in Syria. Moreover, increases in the volume of commodities which the various agencies handle have been sufficient to meet the demand as the population increases.

The assessment team also found that data are available for the Mohafaza level on the production within Mohafazat as well as on the movement of commodities into and out of each Mohafaza. Should these data be accurate, it should be possible to do FBS-type analysis for Mohafazat grouped into five different health regions. With these data and the data from the Health Survey, analyses could be made which could be used to construct arguments for setting nutrition priorities for programs of health, sanitation, food production and food pricing policies among Mohafazat (and/or groups of Mohafazat).

#### 2.4 Nutrient Consumption - Family Level

The nutrition assessment team found no past or current studies of nutrition consumption at the household level.\*

The food balance sheet for Syria is prepared each three years and has been prepared since 1962. The output of these FBS calculations is called the average per capita consumption (currently, for 1978, 85 grams of proteins and 2700 calories per person per day). While this information is valuable, a food balance sheet is not an estimate of the nutritional status of a population, and should not be used as such. A measure is lacking of how the average figures (85 g., 2700 cal. per capita per day) are distributed among the population of Syria. For example, if daily consumption of proteins relative to their minimum daily requirement (MDR) is plotted versus the number of people who consume that amount, the distribution seen in Figure 2 could result. (See Figure 2.)

Depending on the width of the distribution shown in Figure 2, we may find that as many as 10-20 percent of the population are consuming only 50 percent of their minimum daily requirement of protein. The nutrition assessment team searched for data from which the spread of this curve could be estimated, but no reliable and direct data could be found (neither for protein nor for the similar curve for calories).

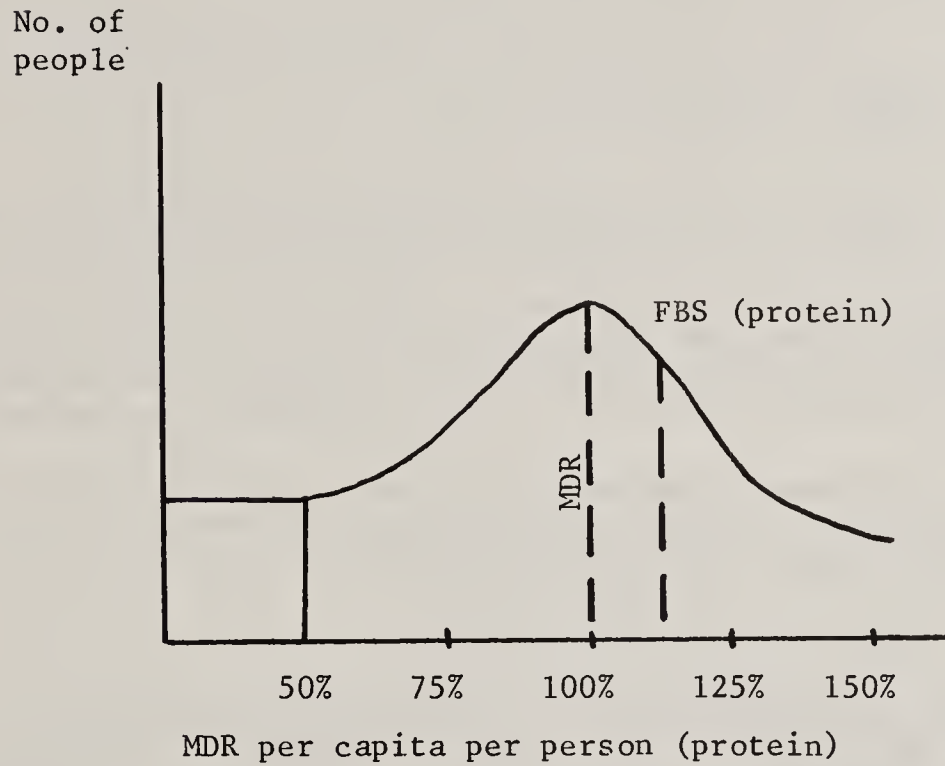
It is important to know the shape of the Figure 2 curve for different regions of Syria. (One should use the same regional boundaries for which the nutritional status is presently being measured in the Ministry of Health survey as well as for the whole country.) The importance of the curve is derived from the fact that methods exist to change the curve's shape, i.e., to channel the distribution

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\*The Household Consumption Survey done by the CBS in 1971-72 does not permit the calculation of nutrient consumption.



FIGURE 2: Hypothetical Distribution of Protein Consumption, where Average Consumption as Indicated by the Food Balance Sheet (FBS) Exceeds Minimum Daily Requirements (MDR)



of nutrient consumption among the members of the population in order to improve nutritional status. The most common types of intervention are:

- 1) wage rates and taxation to control distribution of income;
- 2) price controls on basic food commodities (bread, rice, oil, etc.) at the retail level;
- 3) access to free or inexpensive public transportation; and
- 4) access to marketing centers in rural areas for rural people, perhaps through mobile stores.

If the distribution of nutrients among the families of Syria could be known from a household consumption survey, the average consumption of nutrients from this survey can be compared with the average quantities of nutrients available in the market place (as calculated by the Food Balance Sheet Method). Comparison of these two independent measures can serve as a check on the food balance sheet calculations (or errors in the household consumption survey).

The collection of nutrient consumption data\* at the family level is an important component in the recommended nutrition surveillance system (Section 5, Recommendation 1).

## 2.5 Analysis of Nutrient Demand

Using available data on the consumption of foodstuffs in Syria and data on elasticities of income and population changes in coming years, the demand for commodities can be projected. The marketing assessment team, in Volume 4, Chapter I, has prepared such projections for the years 1985 and 2000 using 1975 as the base year. Based on these commodity demand projections, nutrient consumption projections could be prepared. The data would permit us to estimate the global nutritional status of the Syrian population in the coming years and to propose dietary and production shifts to improve that status at least cost. For example, the contributions to nutrition of certain foods in 1975 are shown in the following table.

TABLE 1: A COMPARISON OF THE NUTRITIONAL COMPONENTS OF WHEAT, POTATOES, LENTILS AND EGGS

	Protein gr/cap/day	Fat gr/cap/day	Calories Kcal/cap/day
Wheat	51.3 g	9.8 g	1,579 Kcal
Potatoes	0.68 g	0.04 g	30.6 Kcal
Lentils	5.84 g	0.32 g	86.5 Kcal
Eggs	1.30 g	1.20 g	16.5 Kcal

\* The Household Consumption Survey carried out by the CBS in 1971 and 1972 does not permit estimates of the distribution of nutrients by income strata.

Wheat provides 75 times the amount of protein in the diet as do potatoes and over 50 times as many calories. Wheat provides 9 times the amount of protein and 18 times the number of calories as lentils. Eggs provide 2 times the protein as potatoes but only half the calories as do potatoes.

Generally, planning decisions which could affect the nutrition of the population would involve changes in the policies of:

- 1) imports and exports for specific foods;
- 2) incentives for production of specific foods;
- 3) designation of land areas for specific food production;
- 4) improvements in storage facilities to reduce losses; and
- 5) reduction in food contamination.

One of the factors to be considered in making such planning decisions is the potential impact of the decision on the nutritional status of the population.

The commodity demand projections for years between 1975 and 2000 indicate that the greatest demand increase will be in meat (106% increase) and dairy and poultry products (98%). The per capita demand for wheat is reduced by approximately 17 percent from the year 1975 to the year 2000. For fruits and vegetables the increase in demand is around 30% while the increase in per capita demand for pulses will be around 5%. These commodity demand projections are based on the estimated increases in income and population for Syria. Also, it is assumed that the commodities are of unlimited availability.

In summary of these demand projections for food, it can be said that food supplies are adequate in Syria today and should be adequate from now until the year 2000. But, this statement does not mean that there is no nutritional problem. On the contrary, the other data we have presented show that there is a nutritional problem now and it may get worse despite favorable supplies of foodstuff. The food supplies themselves may be less than initially estimated.

Some evidence exists, especially the Ministry of Health's Survey, to indicate that equal distribution of nutrients is not being achieved and that malnutrition is a serious problem. Clearly, many of the sampled children are not growing as the average per capita consumption of nutrients would indicate. One possible conclusion is that there exists some families which are not consuming the average per capita nutrients. We have guessed that the poorest 25 percent of the Syrian population may have a nutrient deficit of 30-35 percent below the Syrian average, and it is likely that the 25-percent most-well-to-do segment of the Syrian population is overeating the Syrian average by 30-35 percent. It is recommended that the distribution of nutrients among the population be measured.

The demand figures assume that the nutrient storage and transportation losses are minimal in Syria. In most countries of the world, however, these losses are underestimated. In the United States, the post-harvest wheat losses are over 10 percent. In Africa, grain losses have been estimated to be nearly 40 percent. The loss estimates for the Mid-East (6-8 percent) are used by Syria and they are probably too low, meaning that net supply estimates may be high.

### 3. The Price of Nutrients

Another problem which has to be faced concerns the relative prices among commodities in the projections. We assumed that the same price differential will exist between wheat, pulses, and meat and dairy products in the year 2000 that existed in the year 1975. This is very unlikely. Between 1975 and 1979, for example, the increase in prices of meat and dairy products has been significantly greater than the increase in prices of cereals and pulses.

According to Table 1 of Appendix 3, in 1975 £1 (Syrian) would purchase 143 grams of wheat protein and only 14 grams of protein from relationships for other goods in 1975.

TABLE 2: £1 (SYRIAN) WILL PURCHASE (IN 1975):

	<u>Grams of Protein</u>	<u>Kilocalories</u>
Wheat	143 g	3853
Lentils	128 g	1388
Broad beans	150 g	1537
Meat	14 g	106
Cheese	32 g	284
Milk	20 g	388
Eggs	16 g	137

Today in Syria (1979), £1 (Syrian) will still purchase 143 grams of wheat protein (at the subsidized price), but only 9 grams of protein from meat (lamb)--a difference of 15:1. The factor of 15 (1979 prices) between meat and wheat is large and may well increase to a level of 20:1 in the next few years. As the price ratio between cereals (and pulses) and meat rises to the levels of 10:1, 15:1 or 20:1, it becomes very difficult to have people include more meat in their diets. At these ratios, only the upper 10-25 percent of the income levels will increase their intake of animal products. During the past 3-4 years in the United States, the price of meat increased from 2 to 2½ times its previous price. During this period, the consumption of meat has declined by almost 20 percent.

The demand projections only concern demand and not the actual supply of nutrients. A number of unforeseen events can radically change the composition of diets and the ability of the food system to meet the projected demands.



Given these limitations, perhaps the best procedure would be to take the data as presented and develop a number of scenarios, each with different assumptions. The focus on nutritional status of various segments of the population will enable the planner to evaluate these scenarios in terms of their impact on the well-being of the Syrian population.

Table 2 of Appendix 3 extends the price concept to include the biological value of the protein (all protein is not of equivalent value due to limiting amino acids) and combines the equivalent protein content with the caloric content of the food into a single index (see column 5 of Table 2). This single index is roughly equivalent to the minimum daily requirement of protein and calories (X100) that can be purchased for £1 (Syrian) (at 1975 retail prices). The foods in Table 2 are rank ordered from high Index (best nutrition buy) to low Index (poorest nutrition buy). The ratio between any two index numbers in the ranking is directly proportional to the increased nutrients that can be purchased for £1. For example, the index for beans is 72 and the index for milk is 24. Thus, beans have about 3 times the nutritional value per Syrian pound as does milk. And, broad beans have 60 percent the nutritional value per Syrian pound as wheat but 8 times the nutrient value per Syrian pound as meat.

The above index is for single foods. That is, if one tries to minimize the cost of nutrients, it indicates which food is best to buy. But, people seldom eat just a single food. Diets are mixtures of foods. When foods are mixed, the effectiveness of the protein (NPU) of the mixture can increase greatly. To explain this further, the ability of the body to use the protein in a particular diet depends upon the amounts of nine amino acids (called the "essential amino acids") in balanced quantities. If one of the amino acids is deficient (say by 50 percent), then the body can only make use of 50 percent of the protein for all the amino acids contained in the food (the most deficient amino acid is called the "limiting amino acid").

The deficient amino acids in beans are methionine and cystine. Beans contain only 55 percent of the amount of these two amino acids as necessary. Thus, if one eats only beans, the protein content of which is about 27 percent (a good serving of beans would contain about 30 grams of protein), the body would only make use of 55 percent of the protein contained in the beans. Now, suppose that instead of eating only beans, the beans are eaten with wheat (say par-boiled or bread). In wheat the limiting amino acid is lysine (about 45 percent of the amount required for complete use of the protein). If one eats wheat alone, for every 10 grams of protein in wheat, the body can effectively use only 4.5 grams. But, wheat has a large amount of the same amino acids of which beans are short, and beans have a surplus (about 130 percent) of the lysine which is short in wheat. So when we eat the two together, the body is capable of utilizing 82 percent of the protein in the beans and in the wheat. Thus, the mixture of wheat and beans yields a protein utilization which is better than meat (meat, if eaten alone, is limited to 79 percent utility).

#### 4. Traditional Syrian Diets

Traditional diets in any country are not explained simply by, "that's what the people like to eat." It is true that they "like" to eat those diets, but there is often a fundamental reason for these preferences. Those families with diets based on easily available and nutritious foods have survived times of scarcity of food. These diets are typically well balanced with low-cost nutrients, at least during times of environmental and political stability.

Syrian traditional diets probably have these characteristics. They should be analyzed for their cost for nutritional protein units, calories, minerals and vitamins. As Syria develops its food processing industries, new processed foods will appear in the market. Women, who will then have jobs (working in the food processing plants, no doubt), will no longer have time to prepare the traditional foods, and these will tend to be replaced by processed foods with very high costs for nutrients. More malnourishment will likely result.

We suggest that the analysis of the traditional foods be carried out for their cost per unit of nutrition, and we suggest that these be compared to the unit cost of nutrients in processed and packaged foods. To safeguard the nutritional status of the population, the State Planning Commission may want to specify cost per nutritional unit for processed foods.

Thus, we propose the development of an index for comparing Syrian diets in the same manner that we have suggested our index for the Syrian foods in Annex V, Table 1. Such indices can be very useful in evaluating the nutritional effect of planning decisions.

#### 5. Recommendations

5.1 We believe that nutritional considerations should be explicitly introduced into the planning process. We strongly suggest that a project be launched which would be oriented directly to nutritional analysis which contributes to planning decisions.

Some surveys will be necessary and perhaps even some research, but only those surveys and research activities that can be justified as necessary to be able to analyze the nutritional effects of alternative plans. In other words, research results would be a by-product of the project--a means to the end, not the end in itself.

Such analyses would be greatly aided by some sort of data-processing capability which can reduce analysis time from months to hours. It is suggested that a small team (say, three to seven people) begin such a project--to begin to analyze selected planning or alternative decisions for nutritional impact--for the 1980-85 Plan. After a year or more of experience, some of the team members may benefit from advanced training in some other country. We are

proposing on-the-job training first and then, for those who show some aptitude, skill and interest, to invest in broadening their knowledge and obtaining some credentials.

5.2 It is recommended that the SAR undertake the design and the implementation of a nutrition surveillance (or monitoring) system.

Some of the functions of a nutrition surveillance system are sketched as follows. Generally, observations are made periodically at the family level through the use of sample surveys for measuring growth of children, 0-6 years' old (as in the current health survey in the Dept. of Research and Statistics of the Ministry of Health). Such observations can be grouped for analysis at the levels of:

- 1) Mohafazat;
- 2) regions;
- 3) country.

At the Mohafaza level comparisons can be made of levels of undernourishment among Mohafazat. These comparisons can help establish priorities for possible subsequent actions within Mohafazat. Similar comparisons can be made among regions to determine if regional priorities are required. And for the country as a whole, comparisons can be made with other nations or countries.

The above comparisons can help the Government of Syria specify nutritional policy aims (goals or objectives) at the national, regional and Mohafaza levels.

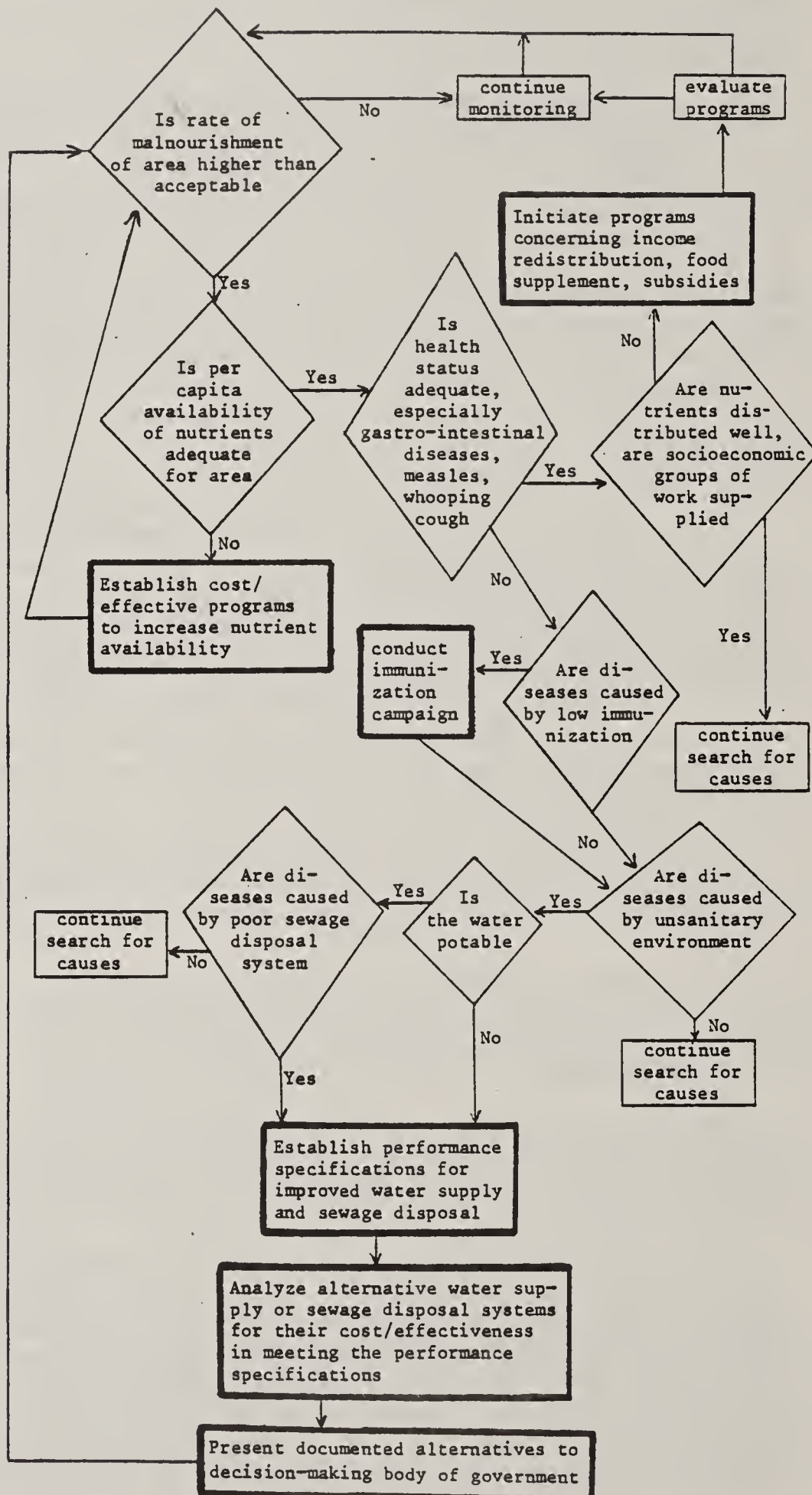
If the surveillance system indicates that all nutritional goals or objectives (at each level) have been met, no remedial actions are necessary. In this case, the system need only analyze the trends:

- 1) nutrient availability (at all three levels);
- 2) nutrient distribution among families;
- 3) health status.

These analyses attempt to detect changes in the above three factors which could cause the undernourishment rate in the Syrian population to drop below the stated goals or objectives in the near future.

If the nutrition surveillance system indicates that the nutritional goals or objectives are not being met for a Mohafaza (or a region), a diagnosis of the area is required. The function of the diagnostic procedure is to analyze the area for causes of the malnourishment and to establish priorities among possible remedies. Briefly, the diagnostic procedure which is described in the following flow chart (Figure 3, p. 16) attempts to detect possible nutrition problems in a step-by-step manner, and not launch large-scale,







complex surveys. The identified problems can then be addressed in specific programs.

If action is taken on one of the alternatives suggested in the analysis (those indicated in the heavily outlined boxes in the chart), the costs and the effects which are explicitly stated in the analysis are predictions of the changes that will occur when the implementation has been completed. The comparison of these predicted costs and effects with the actual costs and effects serves as an evaluation of the above procedures.

It is important to note that extensive, and therefore expensive, studies are in general not being advocated here. For example, only at certain points in the decision model would a consumption survey be done. The objective is to minimize expensive data gathering and analysis and try to focus what is gathered on specific issues facing the planner.

### 5.3 Control and Measurement of Food Contamination

Some types of food contamination are closely related to under-nourishment (such as irrigation with raw sewage, etc.). These have been discussed above. Other types of food contaminations such as might occur in processed food and food contamination in the preparation of food in institutions (including restaurants, school lunch programs and industry) may not have their effects become evident in nutritional status but more likely in emergency medical care units.

The extent of food contamination is not known for Syria. It is likely to be small but also is likely to increase with the increased uses of processed food and more advanced agricultural techniques. Greater use of pesticides, insecticides and fungicides in agriculture, more food processing plants, more technical preservation methods will require food inspection and quality control systems that protect the public from intoxication from such products.

At this time, we only suggest that food standards for purity be set and a monitoring system be designed and implemented as a pilot operation for a small set of selected foods.

### 5.4 Incorporation of Science-Based Planning Procedures into Health and Nutrition Planning

The lack of documentation of studies and analyses was the greatest difficulty for the assessment team. Apparently important decisions are being made without detailed analyses or diagnoses. Some examples of decisions for which no systematic studies or analyses could be uncovered were:

- a) Decisions on price setting of basic food commodities. No documentation was found which analyzed the effect of the prices on nutrient consumption. No analysis was detected concerning effects of subsidized pricing systems on rural area consumption versus urban area consumption. While the

CBS survey is instructive, neither it nor any other study addresses the question of eating habits and food wastage. It is easy to observe, at least in the urban areas, a large wastage of bread but no analysis seems to exist which relates the amount of waste to the price (neither for bread nor for any of the other foods for which prices are controlled by the government). Even if for political reasons the decision is to keep the prices fixed at their present low values, the knowledge of the cost (monetary as well as wastage) of such a policy is valuable.

- b) Decisions on the selections of food for lunch programs. There exist classical scientific methods for selecting optimum diets (by linear programming). No evidence was found that such analyses had been done for the SAR school program.
- c) No studies were located on: (i) the relationship between livestock production and the quality and quantity of nutrients available for consumption at the family level; (ii) the relationship between health and sanitation programs and undernourishment (or morbidity and mortality); and (iii) the relationship between food storage and preservation programs and nutrient availability for the citizens.

Yet, decisions have been made in the past and will be made in the future (for the next Five Year Plan) on livestock production, health and sanitation, storage and preservation, and prices for basic food commodities. It appears as if the planning process consists all too often of the presentation of personal opinions in committee meetings, when more precisely knowing the costs and benefits of nutrition-related programs would be of great use to the decision-makers.

The general orientation of all the above recommendations is to emphasize techniques for making the planning process more efficient. By adopting such an orientation, it is hoped that a foundation would be laid for improving the planning process by comparing the predictions of the analyses which are carried out with the actual results of implementation of the decisions. The difference between predictions and results would then feed back into the implemented programs or into the analysis methods to determine where the errors have occurred. In effect, with properly designed analyses, it becomes possible to build the scientific learning model into the government function of planning. Of course, macroeconomic planning models currently attempt to build in the same learning process, but what seems not to be realized is that this scientific learning process can be built into all levels of planning, and especially into planning which affects the nutritional status of the people of Syria.

5.5 It is recommended that a program be established to begin to develop the human resources of SAR in the area of Scientific Nutrition Planning.

This recommendation relates to personnel in the government bureaus (central as well as Mohafaza level), institutes which currently train planners, and universities.

- a) Science-based practical courses in social problem-solving in SAR universities and institutes. The short time allocated for this nutrition assessment prevented the assessment team from adequately surveying the universities and training institutes which produce planners. However, many interviews suggest that a certain deficiency exists especially concerning nutrition planning. A detailed study of current curricula in various training institutions is called for. Such a survey should start with the schools of public health, preventative medicine, epidemiology. Also, to be included are economics, sociology, anthropology, engineering, and planning in the SAR institutes.
- b) Further training outside of the SAR at the M.S. and Ph.D. levels. Programs at each level (M.S. and Ph.D.) are available at many universities. Also available but not usually recognized for its relevance to nutrition planning is training in the field of epidemiology. The epidemiology of malnourishment is precisely the subject matter which is most directly applicable to the production of scientific-based analyses to aid administrators and politicians in decisions about food and nutrition policies.
- c) Interdisciplinary teams for social problem-solving. Food and nutrition problems (and, in general, most social problems) are not solved by people of a single discipline. In a number of countries it has proven useful to develop interdisciplinary teams. In most governmental bureaucracies, such teams are usually selected from across ministries and attached to the Prime Minister's Office or the State Planning Commission.

Financial resources have been generally used as the incentive for inter-ministerial cooperation. Also, when universities and other institutes (such as those which train planners) are involved in the makeup of the team, the practicality and usefulness of the educational programs are enhanced.

The morale of many of the workers in the government bureaus and the universities of Syria appears to be generally low. In view of this, the "brain drain" from Syria is not surprising. To some degree the stress on scientific-based planning could help reverse this trend. Interesting work, scientific analysis of social problems, the chance that such analysis can be integrated with

political factors and play a role in the decisions, all can serve as encouragement to the technical staff of the government to energetically carry out their technical function. The citizens of SAR could be better served by competition between interdisciplinary teams attempting to lower the infant mortality rate in Syria, for example, rather than competing for large "empires" within the government.



APPENDIX I: DATA RELEVANT TO ESTIMATING MALNUTRITION IN SYRIA\*

A) Main Causes of Children's Deaths from 1-4 Years, Damascus, 1972:

Measles	23.8%
Digestive system/diarrhea	21.4%
Accidents	16.6%

B) Prevalence of Protein-Energy Malnutrition (PEM) in Damascus, According to Weight/Height Ratio:

Nutritional Condition	Males		Females		Total	
	No.	%	No.	%	No.	%
Normal growth and more than normal growth	229	56.0	139	38.19	368	47.0
PEM (mild)	95	23.32	76	20.88	171	22.0
PEM (mod.)	55	13.84	92	25.27	147	19.0
PEM (sev.)	30	7.33	57	15.66	87	11.2

C) Percentage of Deaths in Relation to the Mortality during the First Year of Life in Damascus:

	<u>1967</u>	<u>1969</u>	<u>1971</u>
Deaths of first week, 0-6 days	30.7	28.0	36.9
Deaths of first month, 7-28 days	10.6	10.6	6.0
Deaths of infants from 1-12 months	58.7	60.5	57.1

D) Deaths of Infants and Children in Damascus:

	<u>1967</u>	<u>1969</u>	<u>1971</u>
% of first-year deaths in relation to total children deaths	82.4	78.7	78.0
% of children deaths 0-4 years in relation to total children deaths	98.4	97.6	99.5

(continued)

\*Taken from: Dr. Hisham Ghebeh and Khaled Mardini, "Present Status of Child Health in Syria," Mimeo. document prepared for the International Year of the Child, 1978.

E) Prevalence of Anemia in 927 Children, Aged 0-60 Months, after a Routine Checkup in Damascus by Dr. Mardini:

<u>Age</u>	<u>No. of Children Examined</u>	<u>No. of Anemics</u>	<u>Percentage</u>
10-12 months	175	79	45.14
1-2 years	330	196	59.4
2-5 years	422	232	55.0

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F) Cause of Death by Age Group, 1977

<u>Age</u>	<u>Nutritionally Related Deaths (enteritis, diarrhea, whooping cough, measles)</u>	<u>Other Diagnosed Causes of Death</u>	<u>Total</u>
Under 1 year	628 (24.4%)	1,949 (75.6%)	2,577 (100%)
1-4 years	326 (20.9%)	1,136 (79.1%)	1,462 (100%)
Total	954 (23.6%)	3,085 (76.4%)	4,039 (100%)

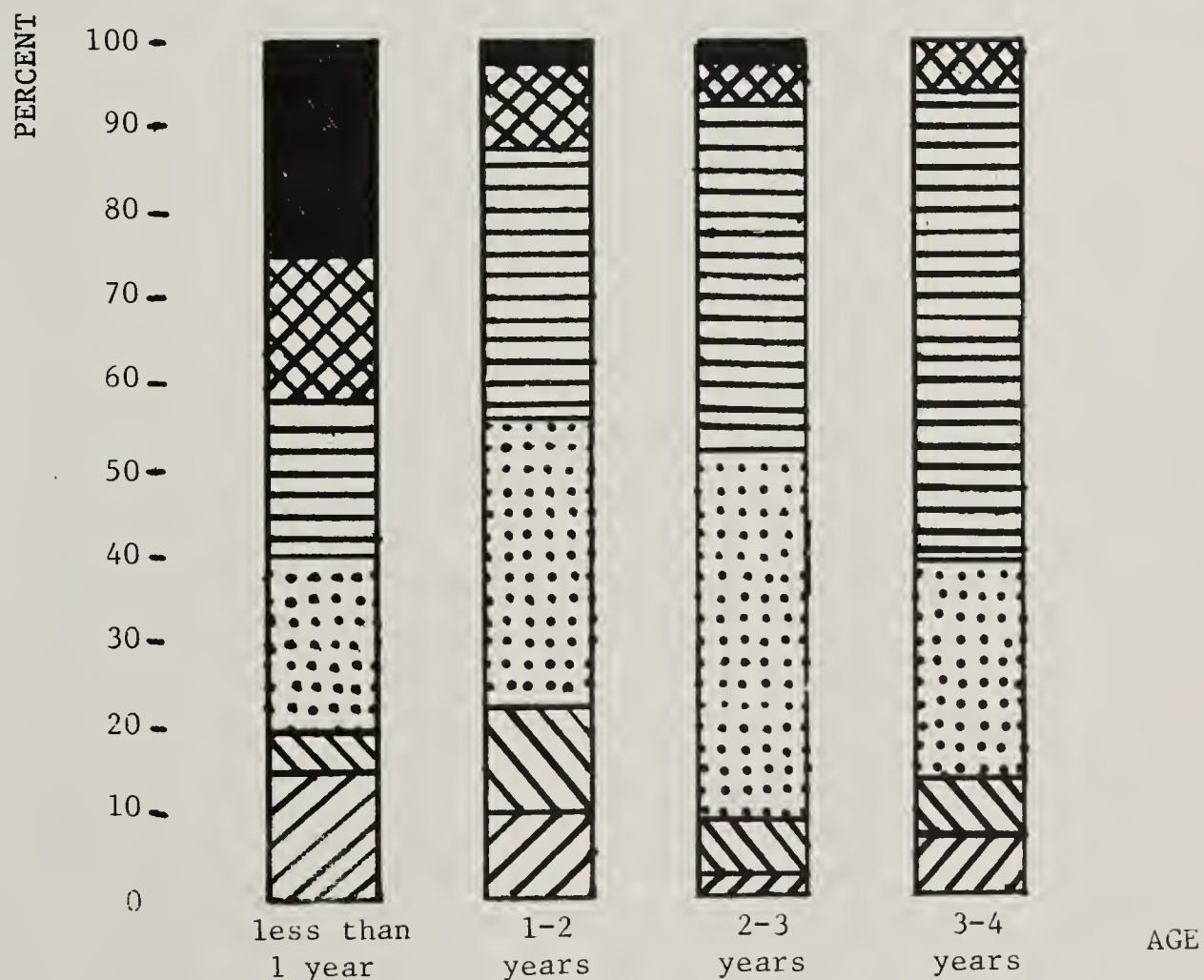
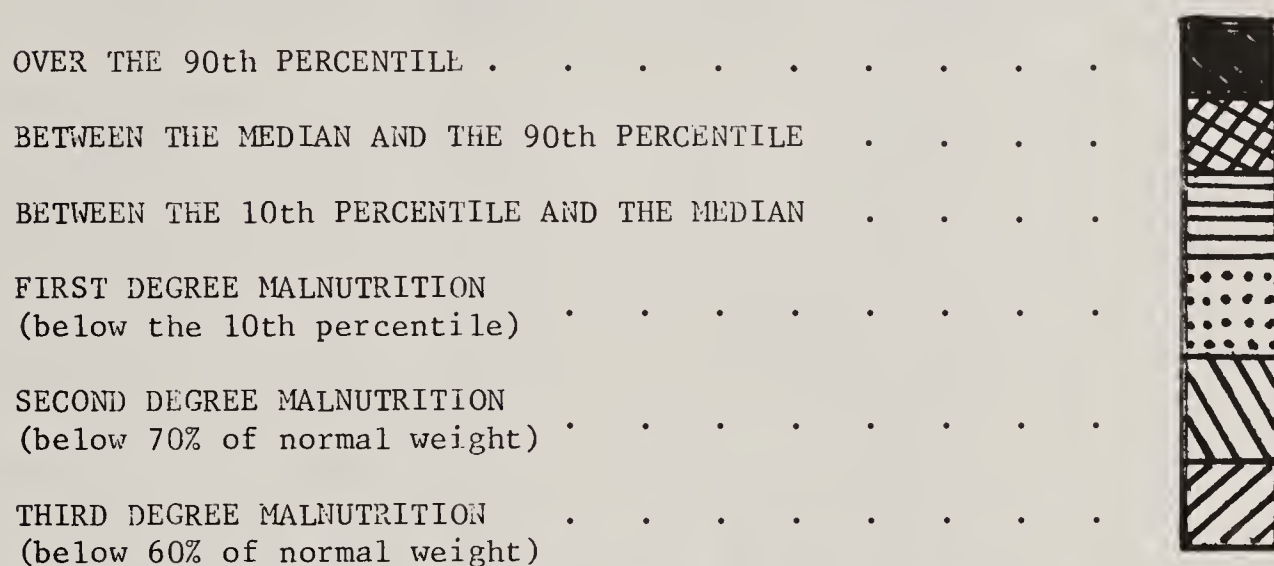
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SOURCE: CBS Statistical Abstract, 1977.

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Appendix 2: NUTRITIONAL STATUS MEASURED BY MINISTRY OF HEALTH SURVEY  
(PRE-TEST)

GRAPH 1: Levels of Malnutrition According to Weight  
Found in the Field Test



APPENDIX 3: NUTRIENTS AND THEIR COST

TABLE 1: NUTRIENTS PER £1 (SYRIAN), 1975

	<u>Protein (g)</u>	<u>K/Cal.</u>
Wheat	143+	3853
Rice	90+	4065
Maize	94+	3134
Barley	135+	4998
Flour	92+	2704
Lentils	128+	1388
Beans	115+	1171
Chick-peas	84+	1320
Broadbeans	150+	1537
Pistachios	9+	253
Walnuts	1+	319
Tomato	7+	195
Eggplant	6+	168
Green beans	14+	461
Okra	8+	156
Cucumber	5+	100
Cauliflower	30+	267
Cabbage	7+	214
Red onion	15+	445
Garlic	15+	337
Apple	1+	251
Oranges	4+	234
Lemons	4+	207
Grapes	3+	396
Apricot	3+	218
Peach	3+	202
Date	9+	1594
Pear	1+	226
Cherry	5+	182
Fish	23+	141
Meat	14+	106
Eggs	16+	137
Milk	26+	388
Cheese	32+	284
Olive oil	0+	1150
Butter	0+	625
Peanut	25.5+	487



TABLE 2: INDEX FOR JUDGING RELATIVE NUTRITIONAL WORTH  
OF DIFFERENT COMMODITIES

	NPU	Protein		Calories	
		Eg. Prot. (1)	% MDR (2)	% MDR (3)	Index (4)
Wheat	55	78.6	131	160	145
Rice	57	51.3	85	169	127
Flour	67	61	102	112	107
Maize	49	46	76	130	103
Broadbeans	47	70	117	64	90
Lentils	56	71	119	57	88
Beans	51	58	97	48	72
Chick-peas	60	50	84	55	69
Dates	100	90	15	66	40
Milk	75	19	39.5	16	24
Cheese	72	23	38	11	24
Olive oil	--	--	--	47	23.5
Peanuts	47	11.98	19	20	20
Fish	83	190	31.8	54	18
Eggs	100	16	26	5	15.5
Butter	--	0	0	26	13
Walnuts	65	6.5	10.8	13	12
Potatoes	71	9.2	15.3	17.3	11.3
Meat	80	11.2	18.6	4	11
Pistachios	65	58	9.7	10.5	10.1

- (1) Eg. Protein = gram of protein purchased by £1 Syrian x NPU.
- (2) % MDR = eg. protein ÷ 60 x 100 (60 is considered UDR of reference).
- (3) % MDR = K/Cal. purchased by £1 Syrian (from Annex VIII) ÷ 24 (2400 K/Cal. is considered MDR of calories).
- (4) Index = (2) + (3) ÷ 2.



Syria: Agricultural Sector Assessment

Volume 5: Human Resources and Agricultural Institutions Annex

CHAPTER VIII

PUBLIC ADMINISTRATION IN AGRICULTURE

Based on the work of

Wilmot Averill and Sami Modaghmesh

TABLE OF CONTENTS

	<u>Page</u>
Preface	ii
I. Governmental Structure	1
Constitutional Framework	1
Central Government Organization	2
Local Government Organization	5
II. Ministry of Agriculture and Agrarian Reform	10
Central Structure	10
Field Organization	13
Specialized Agencies	14
Agricultural Councils	17
III. Other Organizations Affecting Agriculture	18
Ministry of Supply and Home Trade	18
Other Ministries	23
General Peasant's Union and Agricultural Cooperatives	24

(Continued)

IV. Proposed Re-organization of the MAAR	27
MAAR's Present Organization	28
Proposed New Organization	29
VI. Conclusions and Recommendations	37

### PREFACE

The purpose of this report is to assess public administration in Syria, particularly as it relates to the ministries and organizations which have substantial responsibilities for development of the agricultural sector. Sources of information included interviews with government officials, available published reports, and translations made of pertinent laws, decrees and similar government documents.



## I. Governmental Structure

The scope and direction of development in the agricultural sector are strongly influenced by the system of public administration that has been established to achieve the nation's political, social and economic objectives. While the administrative system, as well as the nation's guiding principles themselves, reflect various aspects of Syria's very long history, the present governmental structure has been formed in the period since achievement of full independence in April 1946. Since the Revolution of 1963, the basic objective of the Syrian Arab Republic has been to build a popular democratic socialist state. The Corrective Movement of 1970 continued the commitment to the goals of the 1963 Revolution, but brought about a re-direction of priorities. Fundamental principles and governmental structure were then formalized in the Constitution of 1973. This constitutional setting is briefly reviewed here, and then the system of public administration is examined as it relates to the agricultural sector.

### Constitutional Framework

The Constitution of 1973 is the supreme law of the land. The Preamble, an integral part of the Constitution, states that Syria is a region within the concept of a larger Arab Nation, and that the Baath Arab Socialist Party (Baath Party) is the first movement in the Arab homeland to give Arab unity its meaning. The basic principles are Arab unity, socialism and freedom.

Under the fundamental principles set forth in the Constitution, the Syrian Arab Republic is defined as a democratic people's state, republican in form, sovereign, socialist and part of the Arab homeland. Sovereignty belongs to the people, the President must be of Islamic faith, Islamic Jurisprudence is a principal source of legislation, and the official language is Arabic. The Baath Party is recognized as the leading party in the society and State. People's Councils are to be democratically elected to represent citizen rights in the affairs of state. Cooperative societies are encouraged, and the State is to serve the people and have its institutions safeguard the citizen's fundamental rights.

The economy of the state is socialist and planned, and three types of property are recognized: State ownership of natural resources, public utilities and other public enterprises; collective property owned by popular and professional organizations, production units and cooperatives; and private property owned by individuals. Private property may not be expropriated except for the public good and only then when just compensation is made.

The educational system is to be free and mandatory for the elementary levels. It is to ensure continued progress for social, economic and cultural development, be the basis for unifying the socialist Arab society and stress science, research, physical fitness, artistic talents and culture.

Freedom is identified as a sacred right and the State is obliged to guarantee personal freedom with the supremacy of law a basic principle. All citizens have the right to participate in political, economic and social activity. Accused persons must be considered innocent unless found guilty by judicial process. Privacy is guaranteed for postal and telephone communication, as is freedom of religious beliefs. The right of free speech and press are guaranteed as are peaceful assembly, and demonstration. Women are guaranteed opportunity for full and complete participation in the political, social, cultural, and economic affairs of the country. Military service is mandatory and health services are to be provided to protect and ensure the public health.

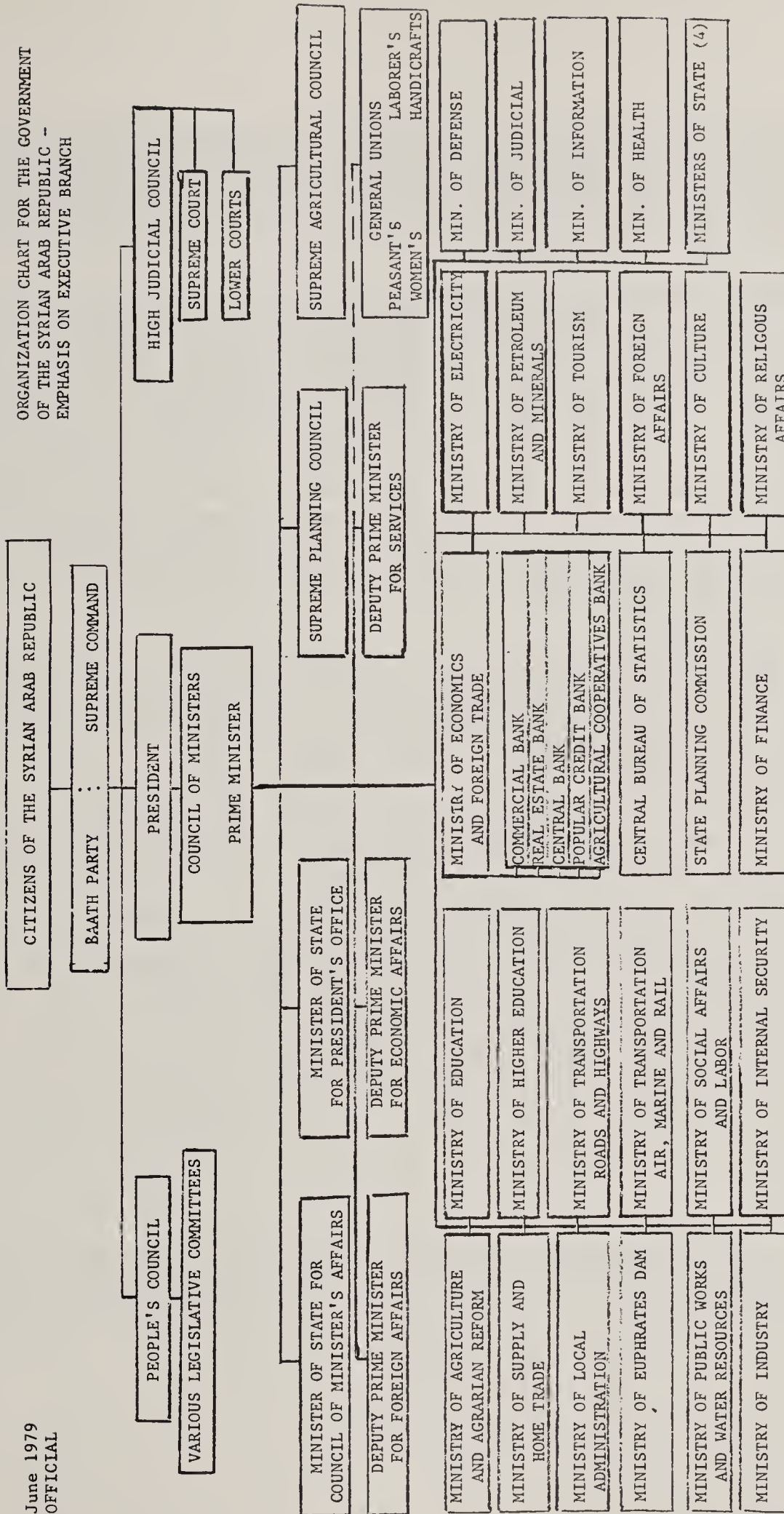
The Baath Party was formed from a merger of two political groups in 1953. Principal ideologies of the party include pan-Arab unity, popular democracy, socialist transformation, and equalizing the distribution of wealth, services, and opportunity between the urban and rural areas. The Baath Party is also organized in other Middle Eastern Arab countries and the party leadership refers to these countries collectively as the Arab Nation. Consequently, the party organizations within an individual country classify themselves as regional. The name used by the executive committee of the Baath Party in Syria is the Regional Command.

#### Central Government Organization

Syria can be classed as a presidential republic, with the government organized into three different distinct branches: Executive, legislative and judicial. See following chart.

The legislative functions of the government are carried out by the People's Council of 186 members who are elected in a general election for 4 year terms. At least one half the members of the People's Council must be peasants or workers and all members must be citizens who are at least 19 years of age. The basic functions of the People's Council are:

6 June 1979  
UNOFFICIAL





Nomination of the President, passing laws, reviewing Cabinet Policies, approving the General Budget and Development Plans, ratifying international treaties, passing a general amnesty, accepting or rejecting the resignation of one of its members, and passing a no confidence vote on a cabinet member or the entire cabinet.

The Judiciary is independent and the President of the Republic, assisted by the Supreme Judicial Council over which he presides, guarantees this independence. Judges are not subject to any authority except as prescribed by law. The honour, conscience and impartiality of judges shall be a guarantee of the rights and freedom of individuals. The Public Prosecution is the judicial institution presided over by the Minister of Justice and law determines its functions and powers. The High Constitutional Court (Supreme Court) consists of 5 members, one of whom serves as President of the court. Members are appointed by Presidential decree for periods of 4 years and this term is renewable. Lower courts include The Court of Cassation, district appeal courts, courts of first instance; and juvenile and religious courts.

The executive branch is headed by The President of the Republic. Candidates are nominated for the Presidency by the People's Council at the suggestion of the Regional Leadership of the Baath Party, and then assume the Presidency when elected by the citizens in a popular referendum. The Presidential term of office is for 7 years.

The powers, duties and responsibilities of the President are to uphold the constitution, exercise the executive power, draw up general policies of the state and implement these in consultation with the Council of Ministries. He may nominate one or more Vice President and delegate duties to them. He also appoints the Prime Minister, his deputies, ministers and their deputies and accepts their resignations or dismisses them from office at his discretion. The President signs laws passed by the People's Council and he may veto them, however this action can be over-ruled if the Council on re-consideration passes the law by a 2/3 majority vote. The President can issue decrees, decisions and orders in accord with laws in force. The President has legislative power when the People's Council is not in session. He can dissolve the People's Council for reason, but elections for a new council must take place within 90 days following such action. He may refer important matters to the people for referendum.

The Council of Ministers is the highest executive and administrative body of the State. It consists of the Prime Minister, his deputies and the ministers.



The Council of Ministers under the chairmanship of the Prime Minister, supervises the enforcement of laws and regulations, and generally controls the functions and organizations of the State in discharge of their duties and responsibilities.

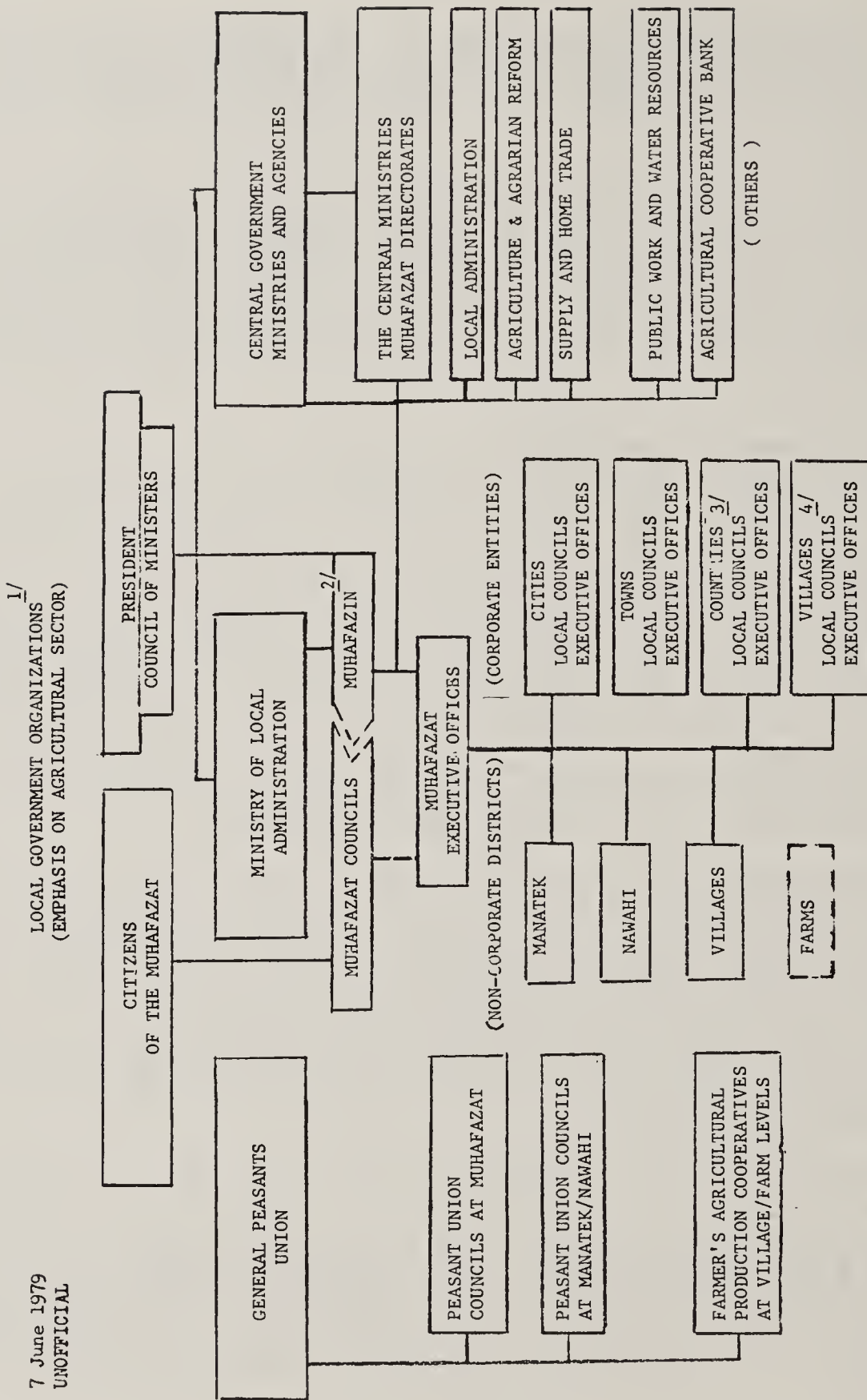
Ministers are the administrative heads of their ministries and are responsible for carrying out the general policies and programs of the State. Some Ministers of State serve in advisory status without portfolios. Ministers may not be members or agents of private commercial establishments during their terms of office, practice in any profession, or directly or indirectly compete for contracts of state offices, agencies or public sector organizations.

### Local Government Organization

Since 1963 the Baath Party has sought to increase autonomy and responsibility in the local and rural areas of the country. The rural areas are to be developed and the lower income workers and peasants are encouraged to assume a more important and direct role in the development process and the political life of the country. Seeking a broader political base, a more representative electorate, and a more equitable distribution of income and social benefits for the peasantry is specified in policy, current laws and programs being implemented. The first steps toward these changes in Syria were the Agrarian Reform Program, the Local Administration Law, and the establishment of the General Peasant's Union. (The Land Reform is discussed in other ASA Reports, and the Peasant's Union and the agricultural cooperatives are discussed in Section II below.)

The principal objectives of the Law of Local Administration (Legislative Decree No. 15 of 11 May 1971) are to center responsibility in the hands of the producing class of people and enable them to exercise leadership, and to make administrative units at all levels responsible for economic, cultural and social services and shift the direction of these affairs to local authority. Also, as stated in the Constitution of 1973, People's Local Councils are to exercise their powers and carry out functions and responsibilities within their administrative boundaries as specified by law. See following chart.

The Ministry of Local Administration is responsible for supervising the implementation of Legislative Decree No. 15. It serves as a focal point for the development of the provinces so that they may be more capable of achieving their planning goals. Until the establishment of this Ministry (under Legislative Decree No. 36 of 12 August 1971), and the passage of the Law of Local Administration, the governmental structure was more highly centralized. For example, the responsibility for education in a city was



- 1/ This organization has been simplified for charting purposes  
 2/ Muhafazin (Governors) have both legislative and executive authority  
 3/ Also described as rural units  
 4/ Corporate if over 5000 population

in the hands of the Ministry of Education in Damascus. The new laws have provided the framework for the transfer of power from the central level down to the local councils. This process of change is still going on and the full transition is in an early stage.

The Ministry prepares elections, supervises their conduct, and reports results. It receives notices of the actions of the various local councils and administrative officers and intervenes where necessary in their defense if a conflict arises with one of the ministries. By working with central ministerial headquarters, it assists governors to coordinate the work of the various ministries in their provinces. It stimulates and encourages rural development, formulating appropriate rural policies to accomplish this end.

The country is divided administratively into 14 Mohafazats, or Provinces, which are corporate bodies and are the first level of government immediately below the central government, see tabulation below. Each Mohafazat has its own elected Mohafazat Council; an Executive Office; and a Governor (Muhafez) appointed by the President to be Chairman of the Council and Chief of the Executive Office. Governors are appointed to serve at the pleasure of the President.

#### Local Government Units in Syria, 1975

Provinces	Districts	Sub-Districts	Cities/ Towns	Counties	Villages
Damascus City	-	-	1	-	-
Damascus	8	21	9	65	194
Aleppo	8	25	8	37	1,415
Homs	5	14	6	46	425
Hama	4	16	5	43	485
Lattakia	4	13	4	29	442
Deir Ezzor	2	8	3	11	127
Idleb	5	15	5	40	403
Hasakah	4	8	4	11	1,637
Raqqa	1	7	3	12	250
Sweida	2	7	3	31	123
Dar'a	1	8	2	25	121
Tartous	5	14	5	29	508
Quneitra	<u>2</u>	<u>4</u>	<u>2</u>	<u>11</u>	<u>163</u>
T O T A L S	51	160	60	391	6,293

Source: Statistical Abstract, 1976

Province = Mohafazat; District = Mantika; Sub-District = Nahia;  
City = Madinah; Town = Baldeh; County = Wehdeh Reefiah; Village = Karyah

The Mohafazat Councils are policy determining and deliberative bodies. Members serve on a part-time basis during their four year elective terms. At least sixty percent of the membership of the Mohafazat Councils must represent the peasants, laborers, craftsmen and people from the lower income levels. The Councils formulate local plans and endorse, after deliberation, plans from a higher level; adopt local rules and regulations, for the administration of utilities and government projects; assume organization authority not specifically reserved to the Central Government; and generally monitor government programs, the expenditure of funds and generation of revenues.

Each Mohafazat has its own Executive Office headed by the Governor. This is the directing, administrative or executive body for the follow-up and day-to-day supervision necessary to carry out the governmental activities within the Mohafazat. Executive Office members, from seven to eleven, are elected by the Mohafazat Councils from among its members for up to 2/3rds of the total. The remaining 1/3 are appointed by the Minister of Local Administration. The tenure for Executive Office membership is two years. The Executive Office distributes the administrative responsibilities among its members and when these are agreed to this is ratified by a decree from the President. Typical duties of Mohafazat Executive Office includes the supervision of the central government's directorate offices, i.e. agriculture, public works, health, etc.; preparation of annual economic and social development plans; contracting local works projects, etc.

The Executive Office of the Muhafazat also provides some guidance to the lower level executive offices in the Districts and Sub-Districts. Neither of these two are corporate or legal entities, but are administrative subdivisions of the Muhafazat. The Districts and Sub-Districts provide services such as doctors and teachers on an area basis where the small legal can not provide them. They also each have an Administrative Committee, and a Chief of District who represents the executive authority of the Government. The Chief's responsibilities include administration of district activities, such as security, welfare, health and law enforcement.

The remaining local units of government are differentiated according to their population, as follows: City - over 20,000 population; Town - 10,000 to 20,000 population; County - over 5,000 population; and Village - 500 to 10,000 population. All except villages under 5,000 population are corporate entities. There are also sectors or localities, while not corporate, are designated areas or neighborhoods (ahya') within a city or town and have some functions such as a ward or borough.



The Province, District and Sub-District are established by law; cities by decree upon ministerial proposal; Towns, Counties, and Villages by ministerial decision following a proposal by the Executive Office of a Muhafazat. Neighborhoods are established by a decision of the City or Town Executive Office. Farms (mezraa) are also considered to be locales in Syria. The population of a farm can be as much as 500 persons. As a rule of thumb, 2 or more villages plus some farms make the Sub-District; 2 or more Sub-Districts make the District; and 2 or more Districts make the Province .

The cities and towns have local councils and executive offices similar to those of the Muhafazat but these are smaller in numbers of members and have some difference in functions. For example the cities are concerned with street sweeping, lighting, parks, water systems, slaughter, houses, etc. All local units of government are responsible, within the general policies and laws of the State, "to carry out those functions which will lead to their development".

Revenues for corporate entities come principally from their enterprise earnings, local taxes, duties, grants, donations, sales of property or rents fines, central government subsidies and loans. To a great extent borrowing and taxing authority are fixed by law or regulations. Each is subject to review and approval by the Ministers of Finance and Local Administration.

Expenses of local units of government include the shared cost of the investment (development) budget, special projects, infrastructive, salaries, allowances and similar operating expenses, debt servicing, contractual services and to cover any deficits of public economic enterprises.

The budget of these corporate entities are similar to the central government budget. They are prepared in two parts - investment and ordinary, by the executive offices of the respective levels and in accordance with Ministry of Finance instructions and the Basic Fiscal Law. When the budgets are prepared they are forwarded up through the hierarchy to become a part of the muhafazah budget. Based on the law itself, there is rather tight central control over obligations and expenditures. The pre-audit system is used and while fiscal accounts close at the end of the year, no report is made for several months thereafter.

Employees working at the local levels, who are graduates of a university, are appointed by the relevant or responsible central government minister. While these employees at the local government level are responsible to cooperate and coordinate with the executive offices providing administrative control, they enjoy exceptions from direct control because

"their duties are outside those exercised by local administrative authorities." For example, the heads of the directorate for several central ministries, health, education, agriculture, etc., have direct access to their respective ministers according to the formal organization. To what degree this might cause problems is not known. It is suspected that the Governor, who is the senior executive officer in the muhafazah, is not troubled by this because he is appointed by the President and has full authority for executive decisions.

## II. The Ministry of Agriculture and Agrarian Reform

The Ministry of Agriculture and Agrarian Reform (MAAR) is a main focal point in national efforts to develop the agricultural sector of Syria. The structure and functions of the central Ministry and its field organization, as well as General Organizations and other agencies under the jurisdiction of the MAAR, are first examined in broad terms in this section. Various other Ministries and General Organizations also effect the agricultural sector, either directly or indirectly, and these are reviewed in section III. The proposed re-organization of the MAAR, which was prepared by a study group in response to recommendations at the 1977 Agricultural Seminar, is outlined in section IV.

### Central Structure

The MAAR, as with other traditional government ministries, is headed by a Minister who is appointed by the Prime Minister and approved by the President, and who is responsible for the direction and administration of the Ministry. He carries out his duties in accordance with government policies and in line with directives of the Prime Minister and Deputy Prime Minister for Economic Affairs.

The administrative structure of the MAAR is based on a typical hierarchical pattern with authority pyramiding to the Minister. Three Deputy Ministers, who report directly to the Minister, are responsible for the operations of the Ministry's various central departments. These departments are organized along both sectoral and functional lines, and their functions can be briefly summarized as follows.

#### Deputy Minister:

-- Department of Planning and Statistics. Supervises overall planning of Syria's agricultural programs, including the preparation of the Ministry's plan for development of the agricultural sector. Also responsible within the Ministry for agricultural statistics, general agricultural policies, legislation and some aspects of international relations.

-- Department of Agricultural Affairs. Responsible for determining the agricultural inputs needed to achieve annual production plans, and for supervising the provision of these inputs to farmers. Also produces seedlings.

-- Department of State Property and Agrarian Reform. Responsible for completing distribution of lands under the Agrarian Reform program, and for controlling state owned properties.

-- Department of Extension. Responsible for the dissemination of technical information to farmers on agricultural production methods. (Details on the re-organization and expansion of this department are given in a separate ASA report.)

-- Department of Plant Protection. Responsible for the identification of diseases, particularly in crops such as cotton and olives, and for providing spraying services to control diseases.

-- Department of Forestry. Responsible for the protection, conservation and utilization of the country's forestry resources. (Details on forestry in a separate ASA report.)

-- Department of Soils. Responsible for soil surveys and land classification and related agricultural and land development activities.

-- Department of Training and Education. Responsible for the education of student at the secondary schools of agriculture, and for training of staff in the MAAR and General Organizations.

-- Agriculture Bureaus. Three commodity oriented bureaus have been established to carry out production research, and to provide product quality control and other marketing services. Long established is the Cotton Bureau, located in Aleppo, which is discussed in more detail in another ASA report on agricultural research. More recently organized are the Citrus Bureau in Lattakia and the Olive Bureau in Idleb.

Deputy Minister:

-- Department of Agricultural Research. Supervises Syria's agricultural research affairs, including the collection of research data from the agricultural experimental stations located in various parts of the country. (Details on agricultural research are given in a separate ASA report.)



Deputy Minister:

-- Department of Animal Husbandry. Supervises animal production in the country, including increasing the number of animals, selection for breeding, protecting animal fodder and designating pasture lands.

-- Department of Animal Health. Monitors animal health affairs throughout the country, including prevention and treatment of diseases.

-- Department of Rural Engineering. Responsible for rural construction, development of farmer housing, preparation of layouts for new farms, and providing technical specifications the purchase of agricultural equipment.

-- Department of Steppe, Range and Sheep. Responsible for Bedouin Affairs and for the management of grazing lands, including preparation of the plan for protection of forage for sheep especially during poor rainfall years.

In addition to the central departments, which report through the Deputy Ministers, numerous other organizational units are required to report directly to the Minister. These include the following:

-- Department of Administrative Affairs. Responsible for preparation of budgets and contracts, accounting for funds and property, conduct of personnel affairs, issuance of operating instructions, making inspections or special investigations, conducting management studies, attending to legislative and legal matters of the Ministry, and operating a central file and secretarial typing pool.

-- Department of Real Estate. Responsible for the survey of agricultural land, the determination of land ownership, and the registration of titles to land.

-- Minister's Office for Organizations and Establishments. The Minister, with the assistance of his office for Organization and Establishments, maintains direct contact with the heads of the General Organizations attached to the MAAR, the State Farms, the Ghab Project, and the Directorates of Agriculture in the Mohafazats.



### Field Organization

In each Mohafazat, the MAAR has offices making up its own field organization. The principal one is the Directorate of Agriculture at the Mohafazat level. These organizations are smaller versions of the central Ministry, and are organized sectorally. While the Directors of Agriculture are appointed by the Minister of Agriculture, as are also all of the college graduates working at this and at subordinates levels, the tie in to the local government is through the Governor, the Ba'ath Party representative for agriculture in the Mohafazat, the chief of the Peasant's Union in the Mohafazat, and the Mohafazat Agricultural Council.

For technical backstopping and activities related primarily to the Ministry, the Directors of Agriculture report directly to the Minister of Agriculture or his delegated representative. But these Directors are also under the direction of the Governors of the Mohafazats. The Governors have paramount authority as Presidential appointees, and are the most influential officers in the Mohafazats. They also serve as the chairmen of the Mohafazat Agricultural Councils.

The organization of the Agricultural Directorate in Aleppo Mohafazat, which is listed below, is typical of the structure of the 13 other Mohafazat offices, although there are some local variations, such as a silk division in Tartous.

#### Director of Agriculture

-- Division of Administrative Affairs: Sections - Accounting, Personnel, Legal Affairs, Files.

-- Division of Planning and Statistics: Sections - Crops Forecast, Economics, Plan Follow-up.

-- Division of Agricultural Affairs: Sections - Horticulture, Fruit Tree Nursery, Crop Production.

-- Division of Government Land and Agrarian Reform: Sections - Land Management, Agrarian Reform.

-- Division of Land Use: Sections - Soil Classification, Laboratory

-- Division of Plant Protection: Sections - Inspection, Protection, Materials and Equipment.

-- Division of Forestry: Sections - Utilization, Protection, Reforestation, Nursery.

-- Division of Extension: Sections - Field Extension, Publications.

-- Division of Animal Health: Sections - Medical Laboratory, Artificial Insemination, Communicable Disease and Isolation.

-- Division of Rural Engineering: Sections - Mechanization, Motor Pool and Shop, Construction and Maintenance.

-- Division of Steppe Lands and Bedouin: Sections - Range Improvement, Bedouin Affairs, Animal Husbandry.

Also reporting to the Director are units for Cotton Statistics Reporting, Seed Testing and Certification, Training and Education, and Agricultural Schools.

There are subordinate offices or representatives stationed at the District (Mantika) and Sub-District (Nahia) levels which deal agricultural matters. These are smaller in scale and more directly connected to the villages and farm level needs. It is at the District and Sub-District levels that licenses for agricultural production are issued to farmers. These licenses are related to the program targets in the agricultural plan and entitle the farmer to obtain loans from the Agricultural Cooperative Bank. In the Aleppo Mohafazat there are 8 District Offices and 24 Sub-District units. (Further details on this organizational structure at the local level are given in the ASA report on agricultural extension.)

#### Specialized Agencies

The MAAR is also responsible for a number of government enterprises that have been established to engage in the production and marketing of various agricultural commodities and inputs, as well as for a special large-scale agricultural development project.

#### General Organizations

Six general organizations that deal in agricultural commodities and inputs have been organized under legislative decrees and placed under the jurisdiction of the Minister of Agriculture. These organizations, and their headquarters locations, are as follows:

General Organization for Poultry (Damascus)  
General Organization for Cattle (Hama)  
General Organization for Fodder (Damascus)  
General Organization for Seed (Aleppo)  
General Organization for Fisheries (Jableh)  
General Organization for Agricultural Machinery (Duma)

There are a number of additional General Organizations that have operations related to the agricultural sector, but there are under the jurisdiction of other Ministers and are reviewed in section III below.

Each of the above General Organization is responsible for establishing and operating various commercial enterprises for the production and marketing of commodities or inputs in their agricultural sub-sector. For example, the General Organization for Poultry operates egg and broiler farms and is constructing hatcheries, the General Organization for Cattle operates dairy farms, and the General Organization for Fisheries is engaged in the development of inland fish farms.

As is the case with other General Organizations engaged in industrial, commercial and financial activities, the agricultural General Organizations are administratively and financially independent units. They are governed by a board of directors and a general management appointed by decree. However, each General Organization also reports to a Minister, such as the Minister of Agriculture or the Ministry of Industry. (Further aspects of the operations of various General Organizations in agriculturally related operations are given in ASA reports on the marketing of commodities and inputs.)

#### State Farms

Six State Farms for crop production are operated under the jurisdiction of the MAAR, as follows:

Name and Location	Capital (SL Mil.)	Land Area (ha)		Crops Produced in 1977
		Harvested	Total	
Al Hamadini Aleppo	18.0	209	209	Cereals, fruit
Al Manajeer Al Hasakah	18.9	553	639	Cereals, Industrial crops
Saalo Deir Ezzor	4.7	290	859	Cereals, Vegetables, Industrial Crops
Al Rasheed Al Raqqa	1.5	6,699	11,289	Cereal, Industrial crops
Al Hourieh Lattakia	8.5	225	238	Cereals, fruit
Damascus Damascus	2.1	269	269	Fruit
Labor Damascus	5.6	na	na	na

The first six farms in the tabulation were created by Presidential Decree in May 1975, and according to the Statistical Abstract, in 1977 they had a total land area of 13,503 ha. of which 8,245 ha. were harvested. Their initial capital investments authorized in the decrees ranged from SL 1.5 to SL 18.9 million. Five of the farms produced cereals, 4 produced fruits or vegetables, and 3 produced industrial crops in 1977. The seventh farm listed above was created by decree in February 1979.

A number of other State Farms in Al Hasaha were turned into production cooperatives for farmers whose land were inundated following completion of the Euphrates Dam. (Further details on State Farms are given in other ASA reports on land tenure and rural change.)



### The Ghab Project

In Idleb Mohafazat, a special agricultural development project area has been created. Except for the very large Euphrates Project, which has its own ministry and which encompasses areas in more than one Mohafazat, the Ghab Project is the only special district of its kind. The purpose for its organization was "to improve and take advantage of a natural regional asset, to assist economic growth, gain more equitable income distribution for participating rural farm families in the area, and create spin-off employment in and around the project area." A Ghab management organization, with an independent budget was set up in 1951 to drain the extensive swamps within the project area, to provide necessary physical structures for irrigation, and to utilize hydro-electric power which may be generated. In 1959 this organization was replaced by the Major Project Administration of the Ministry of Public Works and Water Resources, which was responsible for the initial construction works.

At the present the Ghab project is being administered by a General Director who reports directly to the Minister of Agriculture and Agrarian Reform. Coordination at the local level is obtained through the Idleb Governor who chairs meetings for provincial coordination. Local directors of several ministries which have personnel at the Mohafazat level are also represented at these meetings. These include the Ministries of Labor and Social Affairs, Agriculture and Agrarian Reform, and Local Government Administration, as well as the Agriculture Cooperative Bank, the Peasant's Union, and the local political leaders. Coordination at the sub-provincial level is secured by periodic meetings of the District staff.

### Agricultural Councils

A Supreme Agricultural Council (SAC) was established under Law No. 14, which was approved by the People's Council on 9 November 1975. It requires that all government agricultural activities be planned each year and coordinated so as to maximize production and productivity. The Council is responsible for approval of plans and their subsequent follow-up to assure effective implementation. The SAC's principal functions are to: (a) approve agricultural production targets for selected products; (b) fix production prices for these products; (c) approve agricultural credit policies; (d) fix prices for selected production inputs, chemicals, fertilizers, etc., (e) approve marketing policies for commodities within government programs; and (f) provide over-all coordination and supervision for the policies and roles of all agencies involved in the planning and implementing agricultural programs under government direction,

The SAC's membership is composed of the Prime Minister, Chairman, the Deputy Prime Minister for Economic Affairs, the Baath Party's Senior Representative for Peasant Affairs, the Executive Director of the Peasant's Union, and the Ministers of Agriculture and Agrarian Reform, Planning, Economy and Foreign Trade, Industry, and Supply and Home Trade.

The follow-up function of the SAC is carried out by a sub-committee headed by the Minister of Agriculture and Agrarian Reform. Its members include the three Deputy Ministers of Agriculture, plus three other persons at the Department head level of MAAR selected by the Minister, the Executive Director of the Peasant's Union, the Secretary of the Peasant's Office of the Baath Party, and the Director of the Agricultural Department in the Ministry of Planning. Other government officials may serve as ad hoc members of the SAC sub-committee when invited by the Minister. This is usually done for expertise on a particular subject, i.e., Director of the Agricultural Cooperative Bank for credit matters, etc. This Committee is responsible for monitoring the implementation of all agriculture plans and programs and is responsible to recommend plan changes where necessary including the adjustment to government set commodity and input prices, etc.

Mohafazat Agricultural Councils were also created by law to serve the needs of planning and follow-up at the provincial level. Each is chaired by the incumbent Governor and its membership includes the Chief of the Mohafazat's Peasant Union, the Director of Agriculture, the Branch Director of the Agricultural Cooperative Bank, a representative of the Executive Office of the Mohafazat and the Mohafazat's Baath Party representative responsible for peasant affairs. These Councils develop local plans, make recommendations and pass them up to the central level. They also monitor and coordinate implementation of projects in these respective areas.

Similar but less structured Councils are also prescribed for the subordinate administrative units of government in the Districts, Sub-Districts, and Villages. This is to permit communications on matters of agriculture to flow through official channels from the bottom to top and vice-versa.

### III. Other Organizations Affecting Agriculture

While the Ministry of Agriculture and Agrarian Reform plays a decisive role in the agricultural sector, numerous other organizations also contribute to this sector's development. This includes various Ministries, and certain General Organizations under Ministerial jurisdiction, as well as such other organizations as the General Peasant's Union and the Agricultural Cooperatives.

#### Ministry of Supply and Home Trade

The Ministry of Supply and Home Trade has an important influence on the agricultural sector since it has responsibilities relating to the marketing of both domestic and imported food, recommends profit margin, estimates nutritional requirements, projects food production and import

needs, etc. The current structure and functions of this Ministry are relatively new, having been set forth by the Minister in Decision No. 607, dated April 21, 1979. In general, this structure includes the Consultative Council and 12 Directorates in the central Ministry, as well as Directorates located in the Mohafazats. There are also a number of General Organizations reporting to this Minister.

#### Consultative Council

A Consultative Council has been established with responsibilities for determining basic principles of supply and home trade, pricing and other activities of the Ministry as directed by the Prime Minister, the Supreme Council for Planning and the Economic Committee. The Consultative Council, headed by the Minister, has a membership composed of Deputy Ministers of directors in the central administration and directors of Supply and Home Trade in Damascus City and the Mohafazats. Directors of General Organization reporting to the Minister are to be invited to assist the Council whenever issues pertaining to their organizations are discussed.

Among its duties, the Council discusses and approves the Ministry's plans and its annual budget, investment plans, five year plans and the periodic monitoring reports. It reviews draft laws, decrees, decisions and instructions that the Minister decides necessary to be discussed in the Council, and all trade, supply and pricing matters. It studies and approves internal organization in the Ministry and coordinates all associated issues between the various agencies, establishments and companies of this Ministry. Each director is considered an adviser of the Council for the matters related to his directorate.

#### Directorate of Statistics and Planning

Planning Department: Prepares the Ministry's annual and five year plans in coordination with specialized directorates; assists in preparing the annual working programs derived from the plans; coordinates with the State Planning Commission in preparing for plan implementation; assists in preparation of plans for the public establishments, companies and other entities connected to the ministry; conducts related economic and scientific studies; submits proposals for indicators, standards and regulations; prepares the draft investment, hard currency and fund distribution budget; and participates in the preparation of the demand plan expected annually from the Directorate of Commodities.

Monitoring Department: Follow up on the implementation of the ministry plans; prepares monitoring report on plan implementation and submit comments; follows-up on the implementation decisions and instructions released from the Supreme Council for Planning and the State Planning Commission; and conducts field inspections and make periodic reports.



Statistic Department: Prepares a draft of the annual statistical work plan according to instructions issued by the Central Bureau of Statistics, coordinate this with other Directorates; gathers all pertinent local and international information and statistical data related to supply, home trade and prices and analyze trade publications; participates in statistical research required by CBS; cooperates in the preparation of commodities standards; coordinates issuance or release of statistical information.

#### Directorate of Research and Administrative Development

Research Department: Prepares locally or collects international studies and research pertaining to supply, home trade, pricing and development subjects; organizes studies concerning work improvement; analyzes the impact of supply decisions on the local market; prepares administrative development reviews in the ministry; proposes new technology such as use of computers, calculators, photo copying etc.

Food and Nutrition Department: Prepares the nutrition budget of the country in participation with Directorates of Technical Affairs and Planning and Statistics; conducts and publishes studies on foods available in the country to determine their nutritional and economic importance; studies local consumption and forecasts trends; follow-up on recommendations of local and foreign organizations specialized in nutrition and foods affairs; organizes studies related to nutrition; participates with local and international entities in nutrition education conferences.

Manpower and Training Department: Evaluates manpower and educational needs in the central administration, the Mohafazat Directorates and in other related agencies to assure best utilization of employees and to enhance the technical base of the Ministry; analyzes jobs and assignments to determine special training needs for employees both in-service or foreign; coordinates and implements training.

#### Directorate of Pricing

Studies Department: Prepares pricing studies; follows-up on implementation of pricing policies; estimates profit margins necessary for producers; recommends prices considering stabilization objectives; monitors the price limit regulations; manages the publication of prices when approved.

Service Department: Proposes commercial services to be undertaken; determine costs of services and influences of prices of consumer commodities; monitors the extent to which costs in the Mohafazat are in line with Ministry decisions.



Food Pricing Department: Recommends prices and the allowable profit margins of both imported and domestically produced foods; monitors prices to determine if policies and regulations are being adhered to.

Non-food Pricing Department: (Same as Food Pricing)

Regulation and Revolving Fund Department: Keeps a special file for all commodity prices which have been stabilized; advise importers, producers and distributors to transfer the differences to the account of the revolving fund; submit balances in the revolving fund account; keep registers for supply deficits resulting from price stabilization.

#### Directorate of Food Commodities

Responsibilities of this Directorate are divided among three departments: Fruits and vegetables; Cereals and bread; and Other foods. Each Department has the same functions for its commodities, which are: to estimate the total requirements of the country and prepare measures to provide them in concert with the supply plan; prepare the draft expected demand plan in collaboration with Directorate of Planning in the Ministry; prepare a periodical table of the supply situation for basic commodities; recommend, if necessary, restrictions on producing, transportation and consuming foodstuffs; propose sequestering for supply security, any food stuff, transportation means, holdings, shops or commercial and industrial facilities; study storage capabilities and make proposals concerning the improvement and capacity of storage; participate in the estimation of required raw materials for the industry; gather and analyze statistics on commodities movement, production, sales and storage and provide it to the Statistic Department monthly; provide opinions for licensing of industries related to consumables; determine the commercial reserves of foodstuffs that must be available; trace the adequacy of commodities in and out of the country as to production and quantities.

#### Directorate of Non-Food Commodities

Responsibilities of this Directorate are divided among three departments: Fuel and construction materials; Clothes and leather; and Other non-food materials. Each of these departments performs the same tasks for these non-food commodities as are done for food commodities.

#### Directorate of Home Trade

Department of Special Trade: Prepares recommendations and monitors the activities of retailers and wholesalers in the private sector who are trading in consumables; issues licences and handles disputes; responsible for licencing foreign traders; reports on its activities statistically to the Directorate of Planning & Statistics.

Department of Government Trade: Responsible for the regulations and relations with the public companies; coordinates transport and raw materials imports; prepares studies on new companies that need to be formed; works with the Commercial Bank regarding financing for state enterprises.

Department of Commerce Registry and Chambers: Provides regulatory functions for the private sector.

Directorate of Commercial and Industrial Ownership Protection:

This Directorate has two departments for Trade Marks and Industrial Samples and for Invention Property and International Agreements.

Directorate of Technical Affairs

This Directorate has three departments including a Laboratory for Materials Testing, a department for Specifications and Standards and a department for Weights and Measures.

Directorate of Cooperative Trade

This Directorate provides many of the services already covered in other directorates, but for the cooperative sector rather than public and private sectors. These include Planning and Statistics, Finances, Public Affairs and Training and Extension.

Directorate of Operations

This Directorate is responsible for stock piling food and materials for use in case of emergencies.

Directorate of Legal Affairs and Directorate of Administration and Financial Affairs

These Directorates carry out the functions as mentioned in their names.

General Organizations

A number of General Organizations report to the Minister of Supply and Home Trade. While these Organizations are engaged primarily in operations relating to retail trade and consumer goods of various types, the agricultural sector is strongly influenced by the General Organization for Trading and Processing of Grain. This Organization has the state monopoly for grain trade and is the sole legal purchasing organization. Also, among the Companies under this Organization are the General Company for Mills and the General Company for Baking. In addition, the General Company for Exploitation of Grain Silos, Feed Plants and Seed Plants also reports to this Minister. (Further details on these operations are given in other ASA reports on marketing.)

### Other Ministries

Other Ministries also affect the development of agriculture, particularly through certain General Organizations and other agencies that operate in various of the agricultural sub-sectors.

#### Ministry of the Euphrates Dam

This Ministry is responsible for overall development of the Euphrates Basin, including both hydroelectric power generation and irrigated agriculture. Dam construction and power generation have been assigned to the General Administration of the Euphrates Dam, while the construction of the canal and drainage systems, as well as the development of irrigated agricultural production are assigned to the General Administration for the Development of the Euphrates Basin. (Further details are given in other ASA reports on water resources, land tenure and rural change.)

#### Ministry of Public Works and Water Resources

Other than in the Euphrates Basin, this Ministry has responsibility for all aspects of water resource development in the country, including dams, irrigation networks, surface water and ground water. (Further details are given in the ASA report on water resources.)

#### Ministry of Industry

This Minister has under his jurisdiction a number of agriculturally oriented General Organizations, including the following.

General Organization of Food Industries: Plants for processing of fruits, vegetables and milk; vegetable oil extraction, onion drying, and brewing of beer.

General Organization for Chemical Industries: Fertilizer factories, tanneries.

General Organization of Textile Industries: Factories for cotton and wool spinning and weaving, cloth and clothing manufacture.

General Sugar Organization: Sugar factories. (Further details are given in other ASA reports on the marketing of commodities and inputs.)

### Ministry of Petroleum and Mineral Resources

Reporting to this Minister is the General Company for Phosphates and Mines, which mines raw materials for use in the manufacture of phosphate fertilizers. (Further details in the ASA report on inputs.)

### Ministry of Economy and Foreign Trade

In addition to its overall responsibilities for foreign trade affairs, including import licenses and export controls, this Minister has jurisdiction over two General Organizations that strongly influence the production and marketing of important agricultural export crops.

General Organization of Tobacco: Responsible for the production, manufacturing and marketing of tobacco products.

Cotton Organization: Responsible for the ginning and marketing of cotton, as well as construction of storages.

This Ministry also has jurisdiction over the Agricultural Cooperative Bank, which is responsible for financial and banking matters involved in the funding of agricultural development activities.

(Further details are given in other ASA reports on crop marketing and agricultural credit.)

### General Peasant's Union and Agricultural Cooperatives

After the merger of the Ministry of Agrarian Reform with the Ministry of Agriculture in 1968, agricultural cooperatives of all types were organized under a Central Cooperative Union. The government technical staffs supervising and assisting these cooperatives were also combined. In 1974, legislation provided that the General Peasant's Union (GPU) absorb the Central Cooperative Union.

Over 90 percent of the present cooperatives are of the multipurpose type, and the balance are specialized associations relating to sheep, cattle, poultry or fisheries. The multipurpose cooperatives can engage in wide-ranging activities but do one or more of the following: obtain credit for members from the Agricultural Cooperative Bank, market members' agricultural crops and products, and acquire and operate modern agricultural machinery.



Legislation specifies the essential role of farmer member in the operation of the associations, with technical staff provided to direct and assist with the management and activities of the cooperatives.

The General Peasant's Union, while organizationally an independent entity within the structure of the Syrian government, is closely associated with and partially dependent on the MAAR, and other agencies to a lesser degree, for technical personnel. The Union is empowered to have technical personnel seconded from government agencies to serve the needs of the Union and its member cooperatives. There are also close relationships between the Peasant's Union and the Agricultural Cooperative Bank, the Agricultural Cooperatives Bank, the Ministry of Local Administration and the fourteen Mohafazats.

The General Peasant's Union and the Agricultural Cooperatives were established under and operate according to Decree Number 21 which was signed in 20 April 1974. Cooperatives are to be organized at the village level, and they are to have a minimum of 30 members. The cooperatives and their members are consolidated at the Mantika level into a Mantika Association. The Mantika Association again consolidate at the Mohafazat level and are called the Mohafazat level and are called Mohafazat Peasant's Union. The fourteen Mohafazat Unions then make up the General Peasant's Union. This organizational structure can be summarized as shown here:

#### Organization of the General Peasant's Union (GPU)

##### Members of Agricultural Cooperatives at Village Level

The members of each village level cooperative elect at least three of their members to form the cooperative's Administrative Council, each for a four year term. (The same length of term applies to all elected representatives in the entire organization.)

##### Village Cooperatives' Administrative Councils

Members of Administrative Councils elect an Association Council for conducting GPU affairs at the Mantika Level. This Council has 7 to 19 elected members in addition to 2 appointed by the Minister of Agriculture.

##### Mantika Association Councils

All members of the Mantika Association Councils, plus one member-at-large representing each individual cooperative from the Mohafazat conference, elect the GPU Council for the Mohafazat. This council has 17 or 18 elected members in addition to 2 appointed by the Minister of Agriculture.

### Mohafazat GPU Councils

All members of the Mohafazat GPU Councils elect members to the GPU Council. This Council elects between 22 and 26 members who are appointed by the Prime Minister.

### GPU Council

The GPU Council elects from among its membership 11 to 13 members to form the GPU Council's Executive Committee. The Executive Committee develops policy, deliberates and acts as an executive commission. It divides administrative responsibilities among its members, supervises programs, and elects one of its members as GPU Executive Director.

The purposes of the law were "to unify the farmer's efforts, to strengthen their roles in the socialist transformation in the rural sector, and to create a dynamic, socialist and cooperative agricultural sector". The new organization was given the following functions:

The Organization Function. It aims at liberating farmers from tribal, sectoral and regional bondage and at unifying farmers, in their struggle and efforts, to raise their economic, educational, social and health standards.

The Political Function. Winning of farmers so they would be part of the socialist, nationalist struggle, and instead of being the marginal segment of the society, they will realize the objectives of the Arab nation, i.e., Unity, Liberty and Socialism.

The Agricultural Function. The farmers' organizations contribute to the realization of the agricultural revolution via their contribution to the success of the agricultural plans, the elimination of the antiquated agricultural modes of production and the creation of a modern and dynamic agriculture.

The main authority for the General Peasants Union is given in Part 7, Articles 91 through 95. These are paraphrased as follows:

Article 91. The State, public authorities, economic institutions and local authorities shall support the (cooperative) organizations to achieve their aims and success by: (1) Furnishing both real property and monetary assistance; (2) Assisting in agricultural productive and providing loan funds for this purpose; (3) Providing technical support and experts to assist in education and training for (cooperative) members; and (4) Providing the technical, financial and administrative resources necessary for organizing the peasantry activities in several forms.

Article 92. Peasants organizations established under authority of this law shall have the following privileges: (1) Be exempt from certain taxes and fees relating to contracts, legal documents, municipal licences, purchase of farm implements, tractors, harvestors vehicles necessary for their activity; (2) They shall be entitled to 5% reduction in prices for goods purchased from public institutions and 25% for the costs of using public transport for their machines.

Article 93. The cooperatives and unions may be given subsidies from the State and local authorities for the social services they render.

Article 94. The General Union may guarantee loans of the cooperatives with state institutions.

Article 95. The cooperatives and members may receive production loans in accordance with production plans.

There are very strict penalties for tampering with financial records by any member or employee in the Union or the cooperatives or using funds of these in an authorized manner or for personal benefit. In Part Ten of the law the provisions for state supervision of the Union and the cooperatives are spelled out, but these are mostly for financial audits, inspection, and monitoring.

#### IV. Proposed Re-organization of the MAAR

In February 1977, the Prime Minister convened a seminar organized to discuss problems hindering the development of the nation's agricultural sector. In opening the seminar he called attention to the vital importance of agriculture to Syria and to other Arab countries, as well as to the potential that exists for greatly expanding agricultural production. But he also noted that various political, economic, financial and human factors have contributed to problems in achieving rapid agricultural development. He called upon the seminar participants, composed of both technical specialists and political leaders, to recommend solutions to these problems.

In addition to numerous technical recommendations made for solving problems in each of the agricultural sub-sectors, the seminar also adopted several general recommendations that called for study of the administrative systems of the agencies involved in the agricultural sector, for the development of a plan for re-organization of the MAAR for better implementation of the seminar's recommendations, and for devising of systems that would provide financial incentives for employees in the agricultural sector as well as raise workers' productivity.



In follow-up to these general recommendations of the seminar, a study team was formed in order "to analyze the present activities of the MAAR and of other Ministries responsible for agricultural programs, and to make recommendations for better organization of their functions."

In carrying out their analysis, the study team reported that they took into consideration that the principal responsibilities of the MAAR are to achieve three basic goals, i.e., to increase national agricultural output by use of all available resources; to develop all agricultural resources to their full potential especially in the use of irrigation and land exploitation; and organize agricultural producers in the most effective ways so they can implement all agricultural production operations including marketing.

The study teams also proposed the policy that the MAAR should have the primary responsibility for all agricultural activities, except for principal water and irrigation works, and for the farmer's cooperatives. These should remain as now organized under the Minister of Public Works and Water Resources and General Peasant's Union respectively.

In addition to being the central authority for agriculture throughout the country, the MAAR should also provide basic services of non-commercial types, such as extension, training, etc., and should assume responsibility for direction of the production and economic operations, and for the coordination and distribution of responsibilities among the public, private and cooperative groups.

#### MAAR's Present Organization

Following its review of the present organizational structure and functions of the MAAR, the study team reached the following conclusions:

-- The present organizational structure does not have a consistent basis for dividing the Departments according to sectors or tasks. Some of them are operationally specialized, such as research which is found in several branches; and some of them are sectorally specialized without specific functional determination.

-- Research appears to be limited largely to plant production.

-- The Directorates of Agricultural Affairs and of Animal Production do not have well identified tasks.

-- No field personnel are available at the producer level to supervise and help in planning, implementing, and educating the rural people. Extension is limited to a small group of people in the Directorate of Agriculture Affairs who issue some publications.



-- Forming development policies and incorporating these for animal development is divided between the central administration and specialized organizations.

-- All directorates follow the same stratification - departments, divisions, office, section, etc.

-- Production, services and training tasks are mixed among the different directorate, and the central administration, and the specialized organizations.

MAAR's present organization, together with other factors, has contributed to fostering the following negative aspects:

-- The loss of the sense of responsibility.

-- Diffusion and under-employment of employees, especially in the Muhafazats and Mantikas. Also the expertise to carry out assigned tasks is missing.

-- Most employees in the offices are occupied with routine work, such as signing forms, certifying papers, and preparing allotments.

-- Very wide gaps have developed between what is planned for implementation and what is possible to implement.

-- The inadequacy of on-the-job training and development of MAAR's supervisory staff.

-- Limited delegation authority and decision making which causes continual delays and missed targets.

The heavy impact that the actual organization form has on employment inter-relationships and on implementation was noted. When organizational structure and work relationships are neglected, assignments are not completed, organization is unresponsive, interrelationships are neglected, and standards are missing. Consequently, job quality is lowered and potential is wasted.

#### Proposed New Organization

The study team considered two forms upon which the MAAR could be re-organized, each of which is based on work distribution. One is to organize along sectoral lines, and the second is to organized according to functions. The suitability of each form depends on the current nature of the sector, for example, can it be well defined; upon the tasks to be undertaken; and upon the availability of human and financial resources.

The MAAR has used the sectoral approach since it was initiated in 1965. The old Agricultural Directorate was divided into a Directorate of Crops and Directorate of Orchards. The Directorate of Animal Resources also was divided into the Directorate of Animal Breeding and the Directorate of Animal Health. There are also the Directorates of Steppes, Plant Protection, Forestry etc.

Each of these directorates carried out all of the tasks pertaining to the sector, such as research, extension, arranging inputs, formulating or recommending policy, collecting data, and studying and monitoring projects. When tasks were relatively simple and means for operations modest, this sectoral alignment was feasible and justifiable. Since 1965, there have been changes so that there is now a mix of sectoral and functional approaches. The Directorate of Research was established and organized as a functional one task approach. In the functional approach it is necessary to define jobs to be done, such as extension, and then make the Department responsible for all extension: animal, crops, etc.

After reviewing the present organization of MAAR and the tasks faced by the agricultural sector, the following functional divisioning was proposed .

- Separate the planning, policy formulation and general supervision functions from the implementation responsibility in both services and production fields.

- Limit the tasks of the central administration and its branches in the Muhafazats to supervision, orientation and planning, and providing non-commercial services.

- All commercial services (such as providing commodities or services against a cost paid by the beneficiary) should be done by the specialized General Organizations.

- Feasibility and economic studies of projects, commercial types of work etc., should be done by an independent organization which should supervise the implementation for a fixed cost.

- Adopt special procedures for dividing the work and assignment of employees in accordance with job requirements of the particular unit.

An organization based on the functional structuring of the central ministry and on specialized organizations may produce the following benefits:

-- A clear delineation of the functions of each working unit along with its assigned responsibilities so as to avoid confusion and duplication.

-- The establishment of well-defined standards for work and quarterly and yearly evaluations.

-- Better utilization of human resources.

-- Better use of special skills related to tasks to be accomplished.

-- A more effective presence of the Ministry at the field level to identify with and assist the farmers with problems.

-- Provision of appropriate priority for each agricultural activity.

Essential conditions for a successful re-organization include the following:

-- Unselfish spirit: An employee should work within the general framework of the ministry as a whole. This may be secured by establishing regulations pertaining to working relationships.

-- Decentralization: This may be secured by delegation of appropriate authority to each employee.

-- Committees and Coordination: The present practice of mixing functions among different units led to the formation of committees to execute tasks which were supposed to be executed by specialized units. The functional division will resolve this problem but still require a group of permanent committees to coordinate, consult and organize the work at all levels but not to do it.

-- Training and expertise availability: The administration of the agricultural sector requires a large number and mix of specially trained employees. To achieve this, both internal and external training is needed. The training function and responsibility for it is of vital importance in the new organization. Considering the points discussed above, recommendations are made for the re-organization of the Central Ministry Organization, Field Organization, and Specialized Organizations.

#### Central Ministry Organization

Organization for the Central Ministry should be based on functional groupings of specialized directorates, with each of the groups headed by a Deputy Minister as follows:

-- Deputy Minister for Planning: Includes Directorates of Plans and Follow-up, Statistics, Agricultural Policies, Agricultural Legislation, International Activities.

-- Deputy Minister for Agricultural Resources: Includes Directorates of Forestry, Steppe, Soils and Water, State Property and Agrarian Reform.

-- Deputy Minister for Agricultural Research: Includes Directorates of Plant Research, Animal Research, Economic Research and Statistical Analysis, Agricultural Research Centers.

-- Deputy Minister for Agricultural Services: Includes Directorates of Agricultural Extension, Education and Training, Animal Husbandry, Plant Protection, Agricultural Quarantine.

-- Deputy Minister for Administrative Affairs: Includes Directorates of Personnel, Finance, Public Relations.

Suggested guidelines as to the functions of the various Directorates are as follows:

Agricultural Planning. The Directorate of Plan Formulation and Follow-up should be separated into two branches. A separate Directorate of Statistics is recommended because the nature of planning and statistics are different and because agricultural statistics which measure implementation results should be handled independently of the planning and follow-up staff. Other directorates in the same group will be responsible for formulation of policies concerned with: marketing trends, processing, financing, pricing, organizing and investments patterns based on special studies.

The Directorate of Agricultural Legislation should carry on all the legal aspects of the agricultural sector by proposing the required legislation (cropping patterns, agricultural vehicle licenses, agricultural chemical and other import licenses, licenses for tree cutting, etc.) This Directorate has been located in the planning group because of its direct relationship to the planning and monitoring functions.

The tasks of planning and follow-up have been expanded to handle what other sectoral directorates are doing presently e.g., agricultural affairs, animal breeding and others, with regard to plans, programs, project proposals and monitoring.



Agricultural Resources. The agricultural resources grouping is almost self explanatory. It merely adds to the presently existing Directorates of Forestry, Soils, Steppe, and State Property. The Steppe Directorate tasks will be principally field work such as surveying the steppe resources, establishing of grasses, conserving water and special problems of sheep. In carrying out these functions, close cooperative with the Peasant's Union is needed. Cooperation between the steppe inhabitants, both technically and financially, plus support of the research centers and specialized organizations is also needed. The research pertaining to the steppe and sheep should be carried out by a specialized new research directorate and its corresponding centers in the steppe. This is also applicable to the Directorate of Forestry, which should restrict its activities to forest protection, forest roads, reforestation at appropriate sites, the survey of forest resources and the regulation of cutting. Research concerning forest trees will be done in the research centers or in the forest sites under supervision of the concerned research directorate.

It should be mentioned that the protection of agricultural resources may require the establishment of an agricultural guard body to protect forests from fire and cutting and to protect the steppe from ploughing, hunting and overgrazing, and to protect water from dynamite and fishing abuses. Establishment of a separate directorate for this purpose is recommended.

New administrative and organizational procedures concerning the directorates in the resources group need to be developed.

Agricultural Research. This task is too large to be implemented by one directorate. Therefore, several directorates specialized by sector, e.g., plant research, animal research, etc., staffed by technical experts in various agricultural disciplines are proposed. They will be the technical backstop for all groups in the Minsitry, either by providing the required technical and economic information for the formulation of production and investment plans, or by finding solutions for production problems. Research results will be submitted to the extension group, which will then reformulate these solutions in ways that will be easy to understand by extension agents and procedures.

To be more specific, the responsibility for providing special technical data necessary for production is strictly that of the research group. The basic working units of the researcher are the research stations or centers. The research function will require an integrated system of stations in each climatological region to cover major crops, as well as a specialized stations for research in animal breeding and stations for fruit trees, etc. These stations are to be connected directly with the central

administration. Each of them would have its own independent annual budget based on its established research program. A direct cooperation formula between research stations and all other groups and Directorates of the Ministry and its branches in the Mohafazats, especially extension, would be instituted.

A Central Council for Agricultural Research should be established to decide on both long term and annual programs, and the coordination, follow-up and evaluation necessary. This should be headed by the Deputy Minister for Research with membership to include deans of the agricultural schools, directors of research in the specialized organizations, director of the research stations, the Director of Plans and Follow-up, the Director of Agriculture and Resource Planning in the State Planning Commission, and representative of all concerned agencies.

A research committee in each directorate for the same purpose should be also established. It is proposed that a committee in each station should supervise the station, and it should be headed by the director of the station. Membership of the heads of divisions in the nearest agriculture schools will also be invited.

Agricultural Services. This group will be responsible for providing the basic agricultural services offered by the government to the producers, to the cooperative organizations and to the agricultural sector in general. Its main task is to disseminate all technical findings which will increase and improve agricultural production.

The service group should not be responsible for government surveillance or responsible for the implementation of the annual plan. It should encourage producers and help them to implement the plan, but not police it. This group receives the technical material and basic programs from the planning and research groups. The competence of this group may be measured by effectiveness of the delivery of the extension services and the training and education of the farmers. It should not be measured by the technical content of the recommendations, as these are the responsibility of the research group.

The basic functions of this group would be carried out in the dissemination centers, the training centers, the agricultural schools, the animal care centers, and the plant protection centers distributed in the rural area.

### Field Organization

The Ministry's field staff should play a principal role in orienting activities at the Mohafazat and Mantika levels, mainly with regard to extension, training, animal husbandry and plant protection. An exception is made for the agricultural research which needs to be centrally planned and supervised. This is also true for agriculture policies and international activities in the planning group. All other functions of the Ministry of Agriculture should be carried out in the field by field staff. Responsibility for directing and supervising this staff is from the central administration passing down through the Muhafazat and the Mantika offices. Therefore, the higher level should be composed of a smaller number of trained specialists in contrast to the field staff which should contain the generalists and be increased as necessary to man the new basic centers in the rural areas.

It should also be emphasized that field work will be an empty concept in research, service or planning if not accompanied by two main factors. The first factor is programming to determine the nature, quantity, and scheduling of each agricultural technician's work. This includes the objectives to be realized during each period and the means for their implementation. These objectives may be the number of cows treated, vaccinated or artificially inseminated; or the area to be fertilized or planted to certain variety of seeds. The second factor is the means to accomplish the objectives. This requires that adequate types of housing be provided for the technicians wherever these are not available. It means providing transportation and incentives to the technician for working in the field.

The intention is that the technical divisions working in the Mohafazat and Mantika should lead the field work at the centers. It is recommended that the Agriculture Director in the Mohafazat be helped by four deputies. The first to supervise the divisions of planning, follow-up, statistics and legislation; the second to supervise the divisions of forestry, steppe, soils, and state property; the third to supervise the divisions of extension, education and training, animal husbandry, plant protection and health quarantine; and the fourth to supervise the divisions of administration, finance, and public relations. At the Mantika level it is proposed to provide technical divisions to handle the following jobs: planning, statistics, legislation, state property, extension, animal husbandry, and plant protection, as well as steppe or forest where relevant.

### Special Organizations

It was mentioned earlier that all work of a commercial nature should be carried out by specialized organizations of the MAAR. It was also emphasized that the function of these organization should be limited to commercial types of work. Any other function, such as orientation or supervision pertaining to the sub-sector where the organization is situated should be excluded based on a principle of separating the management function from the implementation function.



Setting policy on feed quantities, prices, and distribution procedures is a management task carried out by the Directorate of Agricultural Policy while the purchase and sale of these feeds, their storing and distribution should be handled by the specialized organizations. In other words, management and policy formulation are strictly functions of the central administration, while the implementation of such policies will be the responsibility of the specialized organizations.

The development of the agricultural sector will require the existence of the following organizations:

1. Agricultural Cooperative Bank
2. General Organization for Cotton Processing and Marketing
3. General Organization for Tobacco
4. General Organization for Sugar
5. General Organization for Food Industries
6. General Organization for Cattle
7. General Organization for Poultry
8. General Organization for Fishery
9. General Organization for Fodder
10. General Organization for Seed
11. General Organization for Agricultural Machinery
12. General Organization for State Farms
13. General Organization for Euphrates Basin Cultivation
14. General Company for Tree Plantations
15. General Company for Agricultural Pest Control
16. General Company for Agricultural Project Studies

The first three organizations are presently attached to the Ministry of Economy and Foreign Trade, while the fourth is under the Ministry of Industry. It is recommended that they be put under the jurisdiction of the Ministry of Agriculture.

The 5th through 9th organizations exist at the present time and are under the MAAR. The 10th through 15th should be established to handle the remaining commercial functions, and should also be under the jurisdiction of the MAAR.

The General Organization for Agricultural Machinery should handle all machinery distribution, maintenance and rentals, and should open distribution centers, workshops and rental stations throughout the country.

The General Organization for Euphrates Basin Cultivation should deal with all agricultural aspects of the Euphrates project and the agricultural work now under the General Organization for the Development of the Euphrates Basin should be transferred to this new organization. The new



organization would also receive the newly reclaimed lands when all facilities has been completed. These lands would then become state farms or cooperative lands holdings, and if the latter, would be transferred to the Peasant's Union.

According to Law 18, a General Organization of State Farms should be established. Since these farms are considered as economic entities, they should be included in one organization. It is also proposed to establish a General Company for Tree Plantations, to carry out the special operations of reclaiming mountain lands to orchards. This should be a commercial operation involving both the public and private sector since the country presently does not have such services. Many farmers in the mountain area would establish their own orchards but they lack the financial means to do so. The Agricultural Cooperative Bank could provide medium - and long-term credits for this kind of enterprise. In the case of state-owned land, tree plantation would be ready after planting to form specialized state farms or to establish cooperatives.

#### V. Conclusions and Recommendations

1. The proposal to place all agricultural responsibilities, organizations and personnel under the supervision of the MAAR seems organizationally sound. This appears to be a logical organizational means to consolidate efforts in the agricultural sector, use organization to improve management and speed up communications, facilitate coordination, minimize duplication or conflict and, most importantly, fix responsibility for the sector's performance in one ministry and on one minister.

The study did not, however, develop a fully staffed-out analysis of the effect of the new organization on performance. For example, what constraints presently encountered in carrying out the government's agricultural activities will be solved by these changes? Can personnel and resources be used more effectively? Will the new structure be more responsive to the agricultural sector needs? Will costs be reduced, services improved, red tape eliminated, responsibilities fixed, etc.?

A case in point is the proposal to shift the Agricultural Cooperative Bank (ACB) from the Ministry of Economy and Foreign Trade to the MAAR. The wide spread activities of the ACB in such areas as fertilizer distribution may argue for closer control by the MAAR. On the other hand, the ACB is a bank, performing banking services, so why shouldn't it remain within the family of banks in the Ministry of Economy?

The above comments should not be constructed to mean that the proposed changes would not be an improvement or that they should not be made. Rather, the total effects of the proposed changes should be analyzed, their interrelationships fully understood, and the benefits to be derived set forth clearly.

Also, it should be recognized that the organizational units directly responsible and directly reporting to the minister are too great in number. They should be reduced through use of intermediate levels of supervision.

2. In addition to organizational re-structuring, attention should be given to improving public administration of the resources and personnel being utilized by the MAAR in its various agencies and organizations. Problems of improving administrative practices and efficiency, however, are recognized as being widespread through the governmental structure, and the Fourth Plan and other documents reflect the concern of top officials on the need for better means to administer government activities.

In view of this government-wide problem, it is recommended that the services of a management consulting firm or institute, specializing in public administration studies, be obtained to assist the Organization and Management Directorate (OMD) in the Prime Minister's Office in conducting in-depth public administration study of the entire government's operation and organization. The findings and recommendations of the study should be submitted along with a detailed plan and schedule for implementing the recommendations. All ministries, agencies and organizations should be involved in this study and should be required to participate in it on the highest priority. Contributions, suggestions and recommendations of the organizations and individual employees should be encouraged and solicited during the study.

3. Perhaps the most critical element in governmental administration is the absence of a core of public officials with the necessary specialized training in management, supervisory and administrative skills. Although there has been recognition by high officials of the need for modernization of personnel practices, there is no central personnel agency or commission in the government. While the OMD in the Prime Minister's Office has some personnel activities, their scope is not adequate for the more than one-quarter million government employees (not including security forces). Salaries of government staff have not kept up with rising costs, and there is a patchwork of special rates of pay for different categories of employees even though some are doing the same types of work. Promotions are based on length of service and there are no incentives for superior performance.

It is recommended that a specialist on personnel administration be obtained (either as part of the consulting firm mentioned in 2. above, or as a separate consultant). He should advise especially on the setting up of a central agency, developing a new employees career service law, establishing a personnel system related to functional and standardized job descriptions, like-pay for like-work, and other such components needed to use the talents of public employees more effectively.

4. In addition, the Organization and Management Directorate in the Prime Minister's Office should have additional specialized staff. Intensive training of employees for this office and to fill other management administration positions to be created in each ministry, should be arranged as soon as possible. Both foreign graduate and in-country training should be used. The training should be designed to train trainers as well as administrator supervisors.

5. Middle management and supervisor/foreman type training should be initiated immediately. This should be done in country and preferable on-the-job or after-the-job. If necessary, foreign assistance to help set this type of program up should be sought. This would include curriculum development, training aids and problem solving workshops.

6. The Organization and Management Directorate should be given the responsibility for approving, or at least concurring in, any proposed organization or re-organization of government agencies to help with this specialized work and to assure that standardized nomenclature of organizational units is used. The OMD should be also set guidelines and assist in all ministry administrative improvement studies and in development of functional descriptions. If a centralized personnel system is not established, as recommended above, then OMD should provide the guidance to the ministries in preparing standardized description of positions for all employees. At a latter time they can be used to prepare an adequate classification and pay plan.

7. Increased attention should be given to planning administration, as contrasted with only planning. There appears to be a heavy emphasis on the setting of general goals, without the attendant design for the plan's implementation, coordination and subsequent evaluation. For example, in the case of the MAAR over the five year period 1974-78, actual annual expenditure of development funds averaged only 48 percent of the annual budgeted funds. Analysis is needed of factors affecting the low implementation rates in order to being about future improvements. There is also evidence that sometimes plans are formulated and get approval without the benefit of the professional staff analysis and review available in the State Planning Commission.

Accordingly, it is recommended that no investment programs be approved for funding or implementation until the State Planning Commission has had sufficient time to analyze it and issue recommendations for approval, disapproval or approval subject to modifications.

In addition, an intensive employee education, orientation and training program should be initiated to introduce and train career service employees in the concepts of planning administration as opposed to just planning.



This should be directed to all middle level and policy level supervisors and administrators. It should be mandatory for project managers. This training program should be both foreign, for advanced or graduate study, and in-service or in-country for the short course or orientation requirements.

8. In order to further implement the policy of making local government more autonomous and increasing citizen participation in governmental affairs, authority to make decisions should be made commensurate with the responsibilities assumed. Thus, a greater responsibility and authority for planning policy and over local revenue and expenditure should be given to the Mohafazat Councils on a gradual basis. This could be examined as a part of the consultations services mentioned in 2. above. Also competent and trained manpower must be attracted to the job opportunities in the local and rural areas if the quality and quantity of programs is not to suffer. This will require real employment incentives.

9. In order to deal with problems in the development of the steppe, it has been proposed that a separate Mohafazat be established for this region. There is no doubt that the steppe presents unique problems which may need unique solutions. Doubtlessly other regional situations will also arise where solutions may dictate a unique regional approach. But it may prove difficult and expensive to set up a special Mohafazat to assure that these regions and their people are adequately served and their problems attended to.

Possibly a coordinating organization empowered and funded to work within the delineated area to carry out the necessary programs and services would be more expedient. It might be set up as an institute, or regional authority, having its own legislation and budget with considerable autonomy to carry out its special functions. The legislation could require the cooperation of the affected Mohafazat but at the same time not duplicate or encroach on the normal sub-unit responsibilities they have for carrying out local government services.



Syria: Agricultural Sector Assessment

Volume 5: Human Resources and Agricultural Institutions Annex

CHAPTER IX

AGRICULTURAL RESEARCH

By

Arthur Peterson

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	1
Agricultural Background	1
Past Assessments of Agricultural Research	2
2. The Design of Research in the MAAR	8
Criteria for Guiding Agricultural Research	
Management Decisions	20
MAAR Research Plans and Experiments, 1978-79	22
The 1977 Agricultural Symposium: An In-House	
Assessment of Research	28
3. Research Resources of the MAAR	30
Professionals Working as Agricultural Researchers	
in the MAAR	31
The Resources of the 17 Research Stations	33
4. Agricultural Research in Agencies Other than the MAAR	47
The Euphrates Project	47
Research in the Cotton Bureau	49
Research in the Faculty of Agriculture at the	
University of Aleppo	50
International Center for Agricultural Research in	
Dry Areas (ICARDA)	51
Arab Center for the Studies of Arid Zones and	
Dry Lands (ACSAD)	52
Other Agencies Conducting Agricultural Research	52

(Continued)

5. Cooperation and Coordination among Research Agencies in Syria	53
6. General Recommendations and Observations	54
7. Summary of Conclusions and Recommendations	60

## 1. Introduction

This report deals principally with the research being conducted by the Ministry of Agriculture and Agrarian Reform of the Syrian Arab Republic, and is based on data and information from official reports of the Ministry of Agriculture, discussions with two Deans of Colleges of Agriculture and more than thirty department or experiment station directors. In addition to visiting two universities, sixteen of the Agricultural Experimental Stations were visited between February 1 and March 29, 1979. Although the winter months are not the most desirable time to view field experiments, a detailed questionnaire was completed, field plans were discussed and experimental areas identified and viewed. The information in this report is the sole responsibility of the author, but the input of all those interviewed is greatly appreciated, in particular the discussions with Rafic El-Rayes and Nour Barmada which have had a major influence on this report.

The Agriculture and Irrigation Sectorial Aims of the "Fourth Five Year Economic and Social Development Plan of the SAR 1976-1980" list the General Aim to achieve a real increase in the agricultural GNP ranging between 46.9 and 61.2 percent during the period of the Plan, i.e., a yearly average between 8 and 10 percent. In the policies mentioned to help achieve this aim is included the following policy to encourage agricultural research:

to direct agricultural research toward solving problems impeding the development of agricultural production and services' operations, and to make available specialized technical cadres, incentives and conditions encouraging scientific research (Article 3 of "Policies, Measures and Auxiliary Steps for Implementation of the Plan").

This report attempts to assess how productive agricultural research is and how useful it is and might be for aiding the overall development of Syria. Chapters 1 and 2 of the report discuss the general issues which are faced by agricultural research in Syria. Also discussed are past analyses and assessments of agricultural research in Syria, primarily within the Ministry of Agriculture, including the recommendations put forth by several international missions and the results of these recommendations. Chapters 3, 4 and 5 describe the present organization of agricultural research in Syria and what the principal commodity focuses are. Chapter 6 contains comments on some of the problems observed in the present system which restrict the ability of the system to generate significant research activities.

### 1.1 Agricultural Background

Syria's land area totals 18.5 million ha. of which about 6 million ha. are cultivated, the remaining two-thirds being too arid. About 530,000 ha. are presently under irrigation, but potential exists for doubling this area because of the availability of irrigation water from the Euphrates Dam. Annual agricultural production from rainfed lands varies greatly as a result of the highly erratic

amount and monthly distribution of rainfall, most falling from October through May. Average annual rainfall varies from about 600 mm. along the Mediterranean coast, rising to over 1,000 mm. in the western mountains, and then falling away toward the east and south to below 250 mm. Cotton and wheat are the major crops in the irrigated areas with some apricot and pears now being grown. Under rainfed cultivation the main crops are cereals, and secondary crops include stone fruits such as olives, and various nut trees, also fruits and small quantities of oilseeds, such as sesame and sunflower. The five agricultural areas, based on precipitation, are shown in Figure 1. The area and yield of the major agricultural crops in Syria in 1977 are given in Table 1.

### 1.2 Past Assessments of Agricultural Research

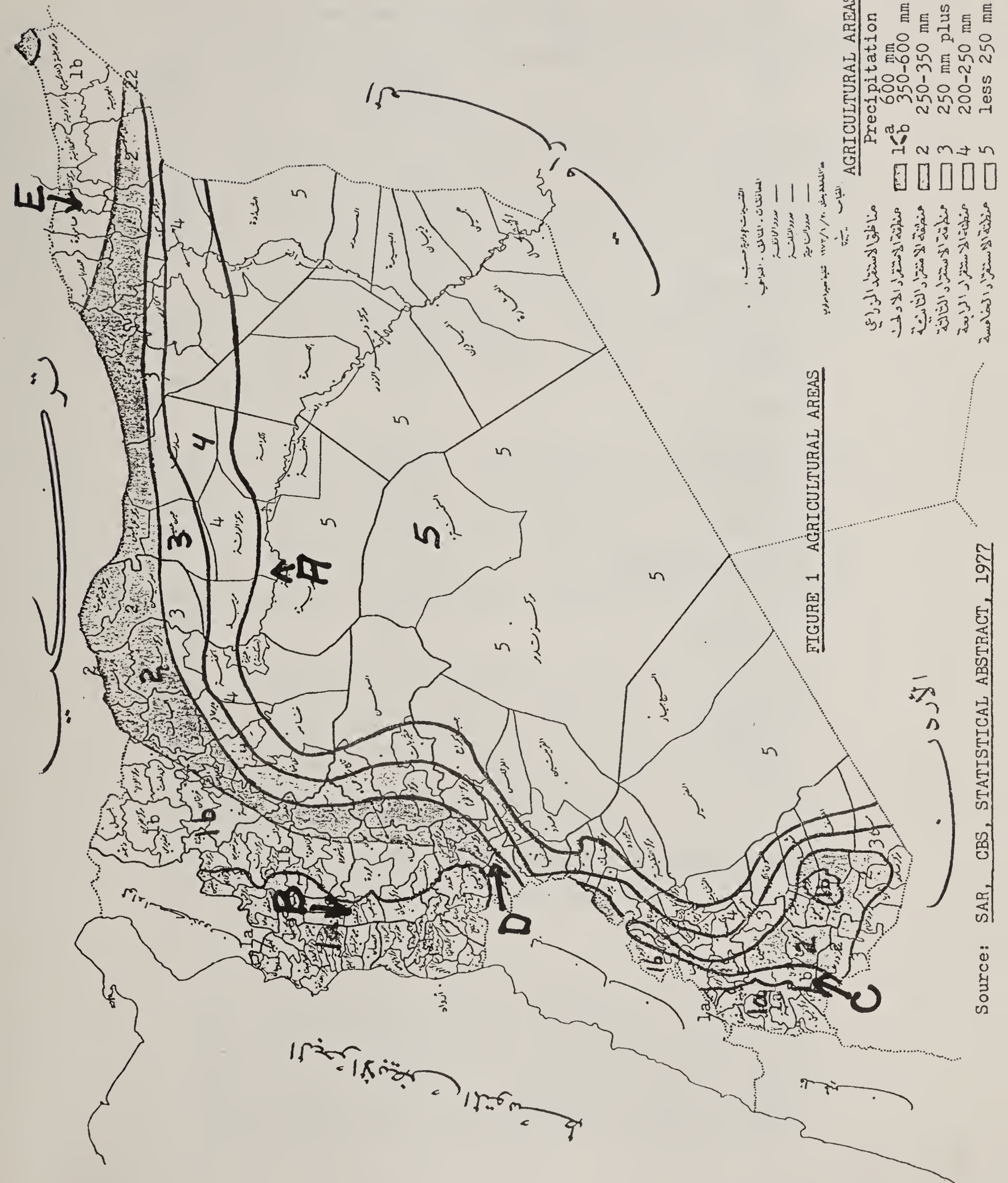
Before entering into the specifics of agricultural research in Syria, some note of past studies of research should be made. Research evaluation has been considered previously by various foreign missions. The International Bank for Reconstruction and Development had a team in Syria for 3 months in 1954 which stated that the 18 experimental stations operating at that time were working more or less independently of each other. Improvement of coordination and central programming in research were felt to be essential. The IBRD further recommended that one station specialize and serve this coordination function. It was felt that eventually this station would become the Central Research Institute, with the others functioning as substations in a single system. They recommended: (a) the establishment of a Central Research Station, preferably in or near Damascus with ample experimental area for future expansion; (b) the recruitment of foreign experts to head proposed departments of the Central Research Station; (c) provision for overseas training of the future Syrian research staff; and (d) a decision on priorities for a building program in connection with research activities.

In November 1962 FAO and Syrian Ministry of Agriculture\* signed a 5-6 year project to: (a) assist the government in developing an organizational structure for planning and administering the country's agriculture research program and relating it to the agricultural extension program and higher education in agriculture; (b) outline a program of applied research in major areas of importance; (d) develop a nucleus of agricultural specialists sufficient to maintain and develop agricultural research in Syria after completion of the project. The Department of Agricultural Research consisted of the following Divisions: (1) Soils and Fertilizer; (2) Field Crops and Agronomy; (3) Horticulture and Food Processing; (4) Plant Pathology; (5) Entomology; (6) Animal Husbandry. The trained staff was lacking in the program which existed at that

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\*Syria: Damascus Agricultural Research Station, UNDP(SF)/FAO Project (SYR 14), Damascus, February 1970.





### FIGURE 1 AGRICULTURAL AREAS

Source: SAR, CBS, STATISTICAL ABSTRACT, 1977

TABLE 1: AREA AND YIELD OF AGRICULTURAL CROPS IN SYRIA (1976)

Crops	Area (1,000 ha.)	Yield (T/ha.)
<u>Cereals</u>		
Wheat	1,590	1.1
Barley	1,059	0.9
Maize	23	2.2
Others	22	--
<u>Dry Legumes</u>		
Chick-peas	67.6	0.8
Lentils	146.5	0.9
Vetch	64.9	0.7
Others	33.5	--
<u>Vegetables</u>		
Watermelon	79.9	7.0
Tomatoes	31.6	16.3
Potatoes	9.9	12.7
Melon	26.1	6.8
Others	73.0	--
<u>Industrial Crops</u>		
Cotton	181.8	2.2
Tobacco	17.6	0.7
Sugar beet	8.5	28.5
Others	68.7	--
<u>Fruits</u>		
Olives	219	--
Grapes	95	--
Nuts	22	--
Others	76	--

SOURCE: Statistical Abstracts 1977 (SAR, CBS).

time and the technical help support staff was minimal. Farms and stations needed skilled foremen. Traveling from Douma was often required on short notice, but administrative approval required considerable advance notice.

Training of staff by foreign experts occurred between 1964 and 1968. Only the 4.7 ha. of land at Douma (1.5 ha. in buildings) were under the direct control of the Department of Research. Many of the other stations were under the control of foreign aid teams. This FAO project required that the Government of Syria, under the plan of operations, establish a standing coordinating committee "to develop an effective mechanism for coordination of research with extension and higher education in agriculture." The committee was to include representatives of the Ministry of Agriculture, the Ministry of Education, the Ministry of Planning and "such other governmental units and private groups as seemed advisable in the interest of coordination and efficient operation of governmental services to agriculture." The FAO Project Manager was to be a member.

Such an Agricultural Research Council was established in 1962. The Council did not include representatives of the Ministries of Planning and Higher Education, but did include the programs of research of the Cotton Bureau and of the Soviet experts at Rakka. A draft decree was prepared for establishing, by law, the Department of Agricultural Research. Proposals were prepared for a constitution of an agricultural research organization by the experts of the project which was considered and given approval in principle. No meetings of the Council, however, were held after 1965.

In 1969, an Agricultural Research Council was established by order of the Minister of Agriculture and Agrarian Reform. The Council included the two Deputy Ministers, the Director of the Cotton Bureau and the Director and other senior members of the staff of the Department of Research. The Project Manager was not a member nor did the Council include representatives of other ministries. Its aims were to study the organizational and other problems of the Department of Research, to draw up annual and long-term programs of research, to evaluate the results obtained and to consider ways and means of obtaining the maximum benefit from the available research facilities. The objectives were, therefore, to strengthen research within the Ministry itself and to relate it to the extension program.

The report stressed:

that while a Council of Agricultural Research has a useful role in coordinating activities in research, extension and higher education in agriculture, its decisions and recommendations have to be applied by the existing organizations. There can be no effective coordination of research with extension unless an efficient agricultural extension service is already available. Similarly the only effective way to relate research to higher education is to strengthen the



Department of Research and to provide facilities for postgraduate studies both at the University College of Agriculture and at the Department of Research where students could work under authorized instructors in part fulfillment of the requirements for their degree. However, the Department of Research is still not sufficiently well organized for assisting in postgraduate studies, and, with certain exceptions, facilities for postgraduate studies at the Universities are still not adequate, while the Department of Extension is weak and cannot make full use of the results of research.

Practically all the work carried out by the Department of Research could be described as agronomic research. The field of activity of the Division of Agronomy was defined.

The FAO project recommended: (a) that the Department of Agricultural Research be strengthened, (b) that it be associated with and actively participate in all foreign aid programs whether by UNDP or under bilateral agreement of the country which contains an appreciable element of Agricultural Research and the work initiated under such programs be continued, where necessary, by the Department. Research activities of the two Colleges of Agriculture should continue to expand. Such work should be coordinated with that of the Department of Research with a view toward avoiding duplication and to ensure the standardization of methods and efficient use of resources. Such coordination was felt to best be achieved through the Council of Agricultural Research and through direct contacts between research workers in the different establishments.

Membership on the Council of Agricultural Research (1969) was confined to the Ministry of Agriculture and Agrarian Reform. It was felt that it would be more useful if the Council were expanded so as to include members from all agencies concerned with agricultural development, services, extension and higher education. The Council, it was felt, should consist of the Assistant Minister for Agricultural Affairs, the Assistant Minister for Animal Husbandry, the Director of Agricultural Affairs, the Director of the Department of Research, the Heads of Divisions of the Department of Research, the Director of the Cotton Bureau, the Director of Research in the Tobacco Monopoly, the Director of the Cereal Bureau, the Dean of the Aleppo Agricultural College, the Dean of the Damascus Agricultural College, a representative of the Euphrates Authority, a representative from the Ministry of Planning, and a representative from the Ministry of Economy. The duties of this Board were (a) to coordinate research to avoid duplication and make optimum use of resources; (b) to link research by foreign experts with the Department of Research; (c) to insure the research program of the Department of Research and other agencies has a direct bearing on the problems of the development of agriculture in the SAR and to implement development programs formulated by the government; (d) to assess cost-benefit of programs; (e) to consider matters of organization, i.e., staff, qualifications, training, laboratory and



station requirements and budget; (f) to hear progress reports on research programs and to evaluate them; (g) to consider matters of postgraduate courses at the two Colleges of Agriculture and to utilize facilities of the Department of Research for research by students studying for higher degrees; (h) to coordinate activities of research and extension and to ensure that all results of practical importance reach the extension service without delay.

The Council was to meet every three months with the Assistant Minister of Agricultural Affairs serving as Chairman, and the Director of Research, Department of Research, as Secretary.

The Council was not a technical committee and not meant to decide the details of research work, i.e., design of experiments, genetic material selection, etc. Ad hoc committees could be set up to assist the Council and usually members of the Council directly concerned with a particular and complex problem would be members of such a committee.

Regional experiment stations were recommended at: (1) Himo, Kamishli; (2) Rakka; (3) Aleppo; (4) Lattakia; (5) Karim, Ghab Valley; (6) Douma; (7) Homs or Hama; (8) Deir el Hajjar, Damascus; and (9) Israu. Sixteen additional stations were listed that should provide research facilities. The first two were: (a) Serghaya, and (b) Ein-el-Arab, Djebel-el-Druz.

The recommendations also state that research and extension is a responsibility of the Council. Well-trained extension officers were felt to be needed, with thorough knowledge of the district in which they were to serve, and they were: (1) to ensure that practical results of experiments are passed on to farmers without delay; (2) to prepare popular leaflets and bulletins, slides, film strips, film exhibits, etc., in collaboration with the research officers; (3) to set up demonstrations in collaboration with the research officers; (4) to organize visits of farmers to the stations and laboratories of the Department of Research; (5) to arrange for research officers to give lectures and to hold discussions with farmers.

FAO recommended, finally, that research and higher education should be developed through direct contacts between the teaching staff of the Colleges of Agriculture and the research workers in the Department of Research. It was suggested that some researchers should teach and students should make regular visits to stations and laboratories. Postgraduate courses could be established at Colleges of Agriculture, but research by university staff would be of a more academic nature. All studies, however, would have bearing on problems of Syrian agriculture. Close contact should be maintained between the staff of the Colleges of Agriculture and the Department of Research in selecting suitable subjects.

These past evaluations of agricultural research in Syria have suggested various administrative schemes which as yet remain

largely unimplemented. The need for coordination and the upgrading of research continue to exist as the following sections indicate.

## 2. The Design of Research in the MAAR

The decisions about which problems should be the topics of agricultural research are difficult ones. Since Syria's internal production resources are scarce and foreign exchange for the import of commodities is also scarce, the overall strategy is to guide agricultural research into problems with the production of commodities where solutions would promise the greatest resource savings. There are a number of ways of defining such problems, including: (1) commodities consumed by most of the population; (2) commodities which engage more of the resources utilized in agricultural production; (3) commodities which are costly to import; and (4) commodities which generate most of the export earnings. Tables 2-13 present some data on these criteria in Syria.

TABLE 2: COMMODITIES WHICH SUPPLY THE MINIMUM DAILY REQUIREMENTS OF PROTEIN AND CALORIES TO THE SYRIAN POPULATION

Commodity	Grams of Protein per Capita per Day	K-Calories per Capita per day
1) Wheat	51.3	1,579
2) Pulses (lentils, chick-peas, beans)	10.10	161.4
3) Potatoes	0.68	30.6
4) Sugar	--	288.3
5) Oils	0.1	251.0
6) Rice	2.5	122.2
7) Milk	3.2	42
8) Cheese	2.5	33
9) Lamb	4.3	65
10) Eggs	<u>1.5</u>	<u>190</u>
TOTALS	76.2	2,762.5

SOURCE: Assessment report by Dean Wilson, 1979.

TABLE 3: AVERAGE LABOR REQUIREMENTS OF SELECTED CROPS

Crop	Average Labor Requirements	
	Man-Days (per ha.)	Total (1972) (000 man-days)
1) Olives (Aleppo, Lattakia, Idleb, Tartous)	63.4	14,486.9
2) Cotton (Aleppo, Hama, Deir-ez-zor, Al-Hasakeh, Al-Rakka)	65.9	12,284.4
3) Wheat (Aleppo, Hama, Deir-ez-zor, Al-Hasakeh, Al-Rakka)	7.2	11,076.7
4) Barley (Aleppo, Hama, Deir-ez-zor, Al-Hasakeh, Al-Rakka)	5.7	5,770.2
5) Watermelon (Aleppo, Hama, Idleb, Al-Hasakeh)	46.3	4,057.2
6) Grapes (Damascus, Aleppo, Homs, Hama)	41.9	3,934.5
7) Lentils (Aleppo, Hama, Idleb, Al-Hasakeh, Dar'a)	18.4	3,274.5
8) Tobacco (Lattakia, Idleb, Tartous)	208.1	3,184.2
9) Tomato (Damascus, Aleppo, Homs, Lattakia, Tartous, Dar'a)	97.0	3,103.7
10) Potato (Damascus, Homs, Hama)	86.9	1,112.4
11) Sugar beets (Damascus, Homs, Hama, Al-Rakka)	74.1	904.4
12) Sesame (Aleppo, Deir-ez-zor, Idleb, Al-Hasakeh, Al-Rakka)	21.9	862.5
13) Chick-peas (Damascus, Aleppo, Idleb, Sweida, Dar'a)	11.3	462.1

SOURCE: Assessment report by Lester Schmid, 1979.

TABLE 4: VALUE OF PRODUCTION AS REFLECTED IN INDEX NUMBERS USED TO CALCULATE VALUE OF AGRICULTURAL PRODUCTION (1977)

Crops	1977 Weight Used in Calculation of Index of Agricultural Production	Livestock and Products	1977 Weight Used in Calculation of Index of Agricultural Production
1) Wheat	148*	1) Milk	
2) Barley	71*	sheep	78 <sup>†</sup>
3) Lentils	13	cow	40
4) Chick-peas	18	goat	23
5) Tomatoes	12		
6) Potatoes	10	2) Meat	
7) Watermelon	13	sheep	95 <sup>†</sup>
8) Grapes	22*	poultry	36
9) Olives	49*		
10) Cotton	149*	3) Eggs	20
11) Tobacco	14		
12) Sugar beets	<u>9</u>	4) Wool	<u>19<sup>†</sup></u>
Sub-total	528 (80%)	Sub-total	311 (91%)
Others	<u>132</u> (20%)	Others	<u>29</u> (8%)
TOTAL	660 (100%)	TOTAL	340 (100%)

\* These commodities represent 67 percent of the index for crop production or 43.7 percent of total index.

<sup>†</sup> Total for sheep products is 192, or 19.2 percent of total index.

SOURCE: CBS Statistical Abstract.



TABLE 5: VALUE OF AGRICULTURAL PRODUCTION (000 S.P.) AT 1963 PRICES

Item	1971	1972	1973	1974	1975	1976	1977
Population (000)	6,494	6,690	6,890	7,121	7,355*	7,595*	7,845*
Total agricultural production (per capita)	1,394.8 (2,152)	1,763.8 (2,636)	1,421.1 (2,063)	1,870.4 (2,627)	2,014.2 (2,739)	2,315.5 (3,049)	2,170.2 (2,766)
Plant production (per capita)	994.2 (1,531)	1,411.3 (2,110)	919.3 (1,334)	1,466.4 (2,059)	1,536.5 (2,089)	1,778.9 (2,342)	1,608.2 (2,050)
Cereals (per capita)	199.0 (306)	438.4 (655)	131.4 (191)	398.4 (559)	380.3 (517)	487.6 (642)	291.0 (371)
Industrial crops	350.8	385.2	363.5	351.0	396.7	393.4	379.6
Fruits	184.6	247.9	142.1	253.4	268.3	325.5	328.0
Vegetables	175.6	243.1	181.2	314.8	362.8	386.4	429.0
Animal (per capita)	400.6 (617)	352.5 (527)	501.8 (728)	404.0 (567)	477.7 (649)	536.6 (707)	562.0 (716)
Milk and products	201.5	177.8	177.5	167.7	172.7	194.7	187.9
Meat	123.3	100.4	253.3	163.2	200.8	237.0	272.4
Eggs	23.8	31.1	37.0	40.5	65.6	70.0	67.2
Wool	42.2	34.1	25.8	23.4	30.2	26.2	27.3

\*These population estimates are possibly too low, according to other CBS data.

SOURCE: CBS, Statistical Abstract.

TABLE 6: WHEAT: AREA AND YIELDS OF MEXICAN AND NON-MEXICAN VARIETIES

Variety	Irrigated		Rainfed		Total	
	Area (000 ha.)	Yield	Area (000 ha.)	Yield	Area (000 ha.)	Yield
Mexican						
1975	119.4	2.13	150.3	1.49	269.7	1.77
1976	158.6	2.46	182.1	1.73	340.7	2.07
1977	142.7	1.97	220.0	1.27	362.8	1.54
(average yield)		(2.21)		(1.48)		(1.79)
Non-Mexican						
1975	55.0	1.95	1,367.6	0.63	1,422.6	0.68
1976	33.7	1.61	1,215.9	0.85	1,249.6	0.87
1977	35.6	1.49	1,070.5	0.62	1,106.1	0.64
(average yield)				(0.70)		
Total						
1975	174.4	2.07	1,517.9	0.78	1,692.3	0.92
1976	192.3	2.31	1,398.0	0.96	1,590.3	1.13
1977	178.4	1.87	1,349.3	0.65	1,527.7	0.80
Wheat in Egypt*						
1973	524.0	3.51				
1974	575.0	3.28				
1975	586.0	3.47				
(average yield)		(3.42)				

\*Data from Statistical Abstract for Arab Countries, 1st ed. (League of Arab States, 1978).

SOURCE: Agricultural Statistical Abstract (Ministry of Agriculture and Agrarian Reform, 1977).

TABLE 7: CEREALS: AREA AND YIELDS

Cereals	1971	1972	1973	1974	1975	1976	1977
Wheat							
area (000 ha.)	1,274	1,354	1,476	1,537	1,692	1,590	1,528
yield	0.5	1.3	0.4	1.1	0.9	1.1	0.8
Barley							
area (000 ha.)	435	593	914	697	1,011	1,172	1,021
yield	0.3	1.2	0.1	0.9	0.6	0.9	0.3
Oats							
area (000 ha.)	2.4	2.8	2.7	2.7	2.9	2.2	1.8
yield	0.8	0.9	0.8	0.9	0.9	0.8	0.9
Maize							
area (000 ha.)	6.5	11.5	11.6	13.5	15.8	23.4	26.2
yield	1.3	1.3	1.3	1.4	1.6	2.2	2.2
Millet							
area (000 ha.)	25.3	33.8	21.6	26.3	22.7	19.6	24.9
yield	0.8	0.8	0.6	0.5	0.6	0.8	1.0

SOURCE: Agricultural Statistical Abstract (Ministry of Agriculture and Agrarian Reform, 1977).

TABLE 8: INDUSTRIAL CROPS: AREA AND YIELDS

Industrial Crops	1971	1972	1973	1974	1975	1976	1977
Cotton							
area (000 ha.)	250.4	238.2	200.4	205.5	208.1	181.8	186.5
yield (tons/ha.)	1.63	1.26	2.02	1.98	1.99	2.25	2.12
Sugar beets							
area (000 ha.)	8.6	9.6	7.7	6.5	8.1	8.5	12.2
yield (tons/ha.)	26.9	26.0	19.8	21.3	23.2	28.5	22.3
Tobacco							
area (000 ha.)	12.9	15.4	16.6	15.6	17.2	17.6	15.3
yield (tons/ha.)	0.574	0.752	0.660	0.650	0.697	0.683	0.753
Peanut							
area (000 ha.)	10.8	12.7	12.2	12.4	12.6	13.4	10.9
yield (tons/ha.)	1.86	1.85	1.88	1.58	1.66	1.78	1.85
Sesame							
area (000 ha.)	10.1	33.5	15.2	34.0	31.5	42.6	39.5
yield (tons/ha.)	0.422	0.289	0.336	0.388	0.433	0.446	0.465

SOURCE: Agricultural Statistical Abstract (Ministry of Agriculture and Agrarian Reform, 1977).



TABLE 9: VEGETABLES: AREA AND YIELDS

Vegetables	1971	1972	1973	1974	1975	1976	1977
Tomato							
area (000 ha.)	20.2	21.8	20.7	29.9	26.7	31.6	32.8
yield (tons/ha.)	12.3	14.5	13.0	13.2	14.0	16.3	13.8
Potato							
area (000 ha.)	5.90	7.78	8.30	8.41	9.45	9.89	12.8
yield (tons/ha.)	12.3	15.3	13.3	12.5	13.2	13.4	12.8
Haricot beans							
area (000 ha.)	3.00	2.94	3.27	4.62	4.77	4.31	3.84
yield (tons/ha.)	6.04	6.55	4.40	6.78	7.93	7.85	7.91
Dry onions							
area (000 ha.)	6.79	5.41	4.75	6.44	5.83	6.83	6.36
yield (tons/ha.)	12.3	11.7	14.6	15.3	16.4	14.4	17.1
Eggplant							
area (000 ha.)	4.62	4.93	4.69	5.34	6.61	7.13	6.18
yield (tons/ha.)	13.4	13.2	12.8	16.3	18.2	14.4	18.5
Okra							
area (000 ha.)	2.37	3.51	2.86	4.01	4.60	6.06	8.19
yield (tons/ha.)	3.45	3.68	3.87	3.78	3.80	2.75	2.78
Cucumber							
area (000 ha.)	8.80	11.32	9.52	11.96	13.43	14.22	18.74
yield (tons/ha.)	6.66	8.41	9.53	11.27	13.63	10.58	9.47
Squash							
area (000 ha.)	4.09	4.53	4.99	6.65	6.92	7.08	7.15
yield (tons/ha.)	9.76	11.0	11.7	11.85	15.09	14.30	13.94

SOURCE: Agricultural Statistical Abstract (Ministry of Agriculture and Agrarian Reform, 1977).

TABLE 10: FRUIT PRODUCTION

Fruit	1971	1972	1973	1974	1975	1976	1977
Watermelon							
area (000 ha.)	38.4	5.67	3.95	7.28	7.20	7.99	8.77
yield (tons/ha.)	6.98	8.11	2.54	7.10	7.66	6.97	8.26
Muskmelon							
area (000 ha.)	15.94	17.89	7.78	19.50	17.54	26.07	25.92
yield (tons/ha.)	5.43	7.27	4.96	7.39	12.72	6.77	7.66
Olives							
bearing trees (000)	12,838	14,515	14,849	15,399	15,646	18,202	18,268
production (000 M.T.)	117.12	161.33	73.18	215.01	156.87	233.40	175.36
Grapes							
fruit bearing (000)	46,317	43,503	48,635	53,573	55,861	59,190	59,985
production (000 M.T.)	208.86	207.52	147.05	249.60	281.04	319.42	352.98
Apples							
fruit bearing (000)	1,819	1,999	2,333	2,434	2,567	2,940	3,081
production (000 M.T.)	34.16	42.39	41.08	44.32	56.56	70.53	61.20

SOURCE: Agricultural Statistical Abstract (Ministry of Agriculture and Agrarian Reform, 1977).

TABLE 11: AVERAGE YIELDS OF SOME CROPS IN 1975  
IN SOME ARAB COUNTRIES

Crop	Syria	Iraq	Egypt	Sudan	Morocco
1) Wheat	0.92	0.58	3.47	1.39	0.93
2) Barley	0.59	0.73	2.81	N.A.	0.87
3) Lentils	0.68	0.94	1.60	N.A.	0.74
4) Chick-peas	0.48	0.65	1.59	N.A.	0.62

SOURCE: Statistical Abstract for Arab Countries, 1st ed. (League of Arab States, 1978).

TABLE 12: PRINCIPAL AGRICULTURAL IMPORTS, 1977  
(000 S.P.)

Imported Items	Value (000 S.P.)	
1) Vegetables (fresh, chilled or simply preserved)	46,842	(5%)
2) Dates, bananas, coconuts, pineapples, mangoes	47,222	(5%)
3) Citrus fruits	69,636	(7%)
4) Apples, pears, quince (fresh)	19,936	(2%)
5) Skin fruit (fresh)	<u>32,610</u>	<u>(3%)</u>
Sub-total	216,246	(22%)
6) Coffee, tea, maté	79,478	(8%)
7) Wheat and flour	261,503	(27%)
8) Rice	53,453	(5%)
9) Seeds and fruit for planting	12,897	(1%)
10) Kernel vegetables	15,630	(2%)
11) Tobacco	27,635*	(3%)
12) Raw hides and skins	19,789*	(2%)
13) Sheep wool, not carded or combed	23,208*	(2%)
14) Sugar	87,588	(9%)
15) Ghee	<u>100,317</u>	<u>(10%)</u>
Sub-total	681,498	(70%)
Other	<u>82,315</u>	<u>(8%)</u>
TOTAL - all agricultural imports	980,059	(100%)

\*Also a major exported item.

SOURCE: CBS, Statistical Abstract, 1978.



TABLE 13: PRINCIPAL AGRICULTURAL EXPORTS, 1977  
(000 S.P.)

Exported Items	Value (000 S.P.)	
1) Dried legumes (mostly lentils)	78,884	(7%)
2) Barley	55,726	(5%)
3) Oil seeds	14,590	(1%)
4) Tobacco (unmanufactured)	19,045*	(2%)
5) Raw hides and skins	38,050*	(3%)
6) Sheep's wool, not carded or combed	49,632*	(4%)
7) Raw cotton, lint, waste	<u>848,566</u>	<u>(75%)</u>
Sub-total	1,104,493	(97%)
Other agricultural exports	<u>32,097</u>	<u>(3%)</u>
TOTAL - all agricultural exports	1,136,590	(100%)

\*Also a major imported item.

SOURCE: CBS, Statistical Abstract, 1978.

## 2.1 Criteria for Guiding Agricultural Research Management Decisions

2.1.1 Commodities Most Consumed by the Population: Table 2 shows those foods which supply approximately the minimum daily requirements of protein and calories of the people of Syria. Wheat, lentils and chick-peas provide the bulk of the protein, while wheat, sugar and oils provide most of the calories. Research should attempt to reduce the cost of these 10 commodities, thereby enabling the country to save substantial resources and/or raise farmers' incomes and reduce the cost of feeding the population.

2.1.2 Labor Costs of Various Commodities: Table 3 presents data concerning the amount of human labor presently being invested in the production of 13 commodities (which occupy most of the agricultural labor employed in Syria in 1977). These figures were calculated on a per hectare basis in order to include in the list those crops which occupy a large number of man-hours per hectare, taking into account the present level of use of labor-saving technology (mostly machinery) in Syria. Multiplying the per hectare figures by the total hectares cultivated in 1977 gives a rough estimate of the relative importance of various crops in terms of their demands for labor.

Olives occupy the most labor, followed by cotton, wheat, barley, watermelon, grapes, lentils, tobacco and tomatoes. These figures can be used either to search for cultivation techniques to expand the area in these crops in order to occupy more labor, or to focus on developing labor-saving technologies for some of these commodities in order to free labor for employment in other sectors of the economy. Strategies for mixing and rotating these crops so that the peaks and troughs of labor demand are smoothed and gainful employment offered throughout the year could also be a research topic.

2.1.3 Value of Production: Tables 4 and 5 give some indication of the relative value of commodity groups. Table 4 presents the weights used in the calculation of the total value of agricultural production in 1977, separating out the weights for crops and livestock.

Clearly wheat and cotton are the central crops, together representing nearly 30 percent of the total index. Sheep, milk, meat and wool accounted for almost 20 percent of the index. The 12 crops and the various livestock products account for nearly 84 percent of the total value of agricultural production.

Looking at the categories of commodities shown in Table 5 (on p. 11), we see that since 1971, only the industrial crops have avoided the dramatic fluctuations of yields which are due principally to the varying availability of water. Table 5 also clearly shows that the value of vegetable production has been increasing regularly and in 1977 is the most valuable category of crop production. Table 9 (p. 15) gives some detail on vegetable production and indicates that the most rapidly increasing of the principal vegetable crops are tomatoes, potatoes, eggplant, okra, cucumber

and squash. The total value of plant production per capita seems to be fairly stable in normal years, if we eliminate the drought years of 1971 and 1973, which means that production is almost increasing at the same rate as the population (see report of Shafer and Blomo). Such a conclusion is of little consolation, however, since in any given year plant production can be a disaster. Production from livestock is also erratic, although less so than crop production. The index of livestock production shows that per capita production is usually less during the past 20 years than the level achieved in 1956 (see Shafer and Blomo).

Some tentative conclusions from these data are that research should attempt to stabilize cereals, industrial and fruit production while increasing yields to keep pace with population growth. This stabilization strategy, of course, is principally a function of the amount of land under irrigation and the development of technologies which are associated with irrigated agriculture.

The degree to which yields of central crops are increasing is shown in Tables 6 through 11 (pp. 12-17). The situation of wheat is detailed in Table 6. Mexican high-yielding wheat was introduced in 1975 and has proved to be an improvement over traditional varieties. As shown in Table 6, compared with such varieties, yields of irrigated Mexican wheat showed consistently higher yields of approximately 10 percent in 1975, 50 percent in 1976 and 32 percent in 1977. By the year 1977 Mexican wheat was being sown on about 80 percent of the irrigated land sown to wheat.

While the amount of nonirrigated land sown in Mexican wheat is small, about 16 percent of the rainfed land in 1977, yields are spectacularly higher than for other varieties of wheat sown in such areas. Over double the yields are being generated with Mexican wheat. Since nearly 70 percent of Syria's wheat is produced on rainfed land, research might be able to explore the reasons for these rainfed-land yields of Mexican wheat and whether climatic conditions are such as to permit its wider use.

The enormity of the wheat production problem and its challenge for research are apparent, however, if we assume that there will be over 17 million people in Syria by the year 2000 who will need 135.5 kilos each, for a total of 2,315,000 tons for the entire country. Assuming that all the irrigated land available to wheat (approximately 200,000 ha. under present conditions) is sown with the Mexican varieties, and that of the 1,500,000 ha. of rainfed land sown to wheat 25 percent is planted with Mexican varieties, and assuming the average yields of Mexican and other varieties for the past three years, the production would be:

	Area (ha.)	Yields (tons/ha.)	Production (tons)
Irrigated (Mexican)	200,000	2.21	442,000
Non-irrigated, Mexican (25%)	375,000	1.48	555,000
Non-irrigated, non-Mexican	1,125,000	0.7	787,500
TOTAL	1,700,000	1.1	1,784,500



Assuming a 15 percent loss and/or nonhuman consumption, there would be a total of 1,517,000 tons available and a total demand for 2,315,000 tons, giving a shortage of 800,000 tons to be imported. If wheat research could combine with the opening of new lands and cut this shortage in half, substantial foreign exchange reserves would be saved.

That there may be room for improving the yields of wheat is indicated by comparing yields on irrigated land in Syria with yields in Egypt (see Table 6). Of course the quality of the irrigated land in the two countries is quite different, but perhaps not so different as the nearly 60 percent higher yields achieved in Egypt. Agricultural research can profitably explore the question of how to increase the yields of Mexican varieties under Syrian conditions, on both irrigated and rainfed lands.

2.1.4 Imports and Exports: Table 12 (p. 18) lists the principal agricultural imports for 1977. Again wheat emerges as a central commodity, which requires approximately 27 percent of the resources devoted to the import of agricultural commodities. Certain fruits are also important, followed by ghee, sugar and coffee and tea.

Table 13 shows the overwhelming importance of cotton as an agricultural export, followed by lentils, barley and wool. The value of cotton exports alone in 1977 almost equaled the entire value of agricultural imports. The tendency to reduce the amount of land planted in cotton which can be observed in Table 8 (p. 14) should be carefully studied in view of the centrality of cotton in Syria's agricultural balance of payments. The research efforts of the Cotton Bureau to develop disease and insect resistant varieties while at the same time maintaining one of the world's highest-yielding cotton-producing systems obviously deserve strong support.

## 2.2 MAAR Research Plans and Experiments, 1978-79

These data give some background for assessing the research program as presently constituted in agriculture in Syria. According to the Ministry of Agriculture's Intensive Plan as derived from the Fourth Five Year Plan, agricultural research attempts to solve a number of problems which limit the productivity of Syrian agriculture.\* Based on data such as that displayed in Tables 2-13 as well as other data, these planning documents have set out for agricultural research the following objectives:

- 1) concerning soils and water, the reclamation and classification of soil and the calculation of most effective rationing of water and fertilizer;
- 2) the development of production of various kinds of fruit, including the following sub-objectives:

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\*Summarized from a paper by Dr. Hamid Kayal and Eng. Walid el Malik, "Expansion of Agricultural Research," prepared for the Agricultural Symposium, held in Damascus, February 1977.



- a) identification of suitable varieties for each ecological region for the most important fruit trees;
  - b) expansion of area in fruit in the nonirrigated zones, such as Huran (Dar'a) and Sueyda, eastern part of the Homs Mohafaza and the northeastern Mohafazat;
  - c) encourage the concern for heredity in production and in teaching institutions;
  - d) introduction of pest resistant varieties of grape vines;
  - e) establish citrus and olive nurseries, free of diseases, sufficient to meet national demand for plantings;
  - f) select high producing varieties of apples, almonds, grapes, olives and pistachios which also meet marketing and processing requirements;
- 3) concerning field crops in general, both varieties and technologies should be improved, as indicated in the following sub-objectives:
- a) develop varieties of field crops suitable to each ecological area;
  - b) give priority to local species and varieties concerning their main characteristics and possible improvement;
  - c) study oil crops to meet the rising demand for vegetable oils and to supply part of the needs for animal feeds (e.g., soybeans, sunflowers, peanut, sesame);
  - d) develop forage crops such as vetch and alfalfa to meet the requirements of the cattle and poultry industries;
  - e) improve the cultivation of feed grains, such as corn and sorghum;
  - f) develop knowledge about sugar beet production under Syrian conditions, and develop a suitable seed stock;
  - g) concentrate experiments on improving agricultural practices and the use of inputs;
  - h) find appropriate uses of machinery on such crops as lentils;
- 4) research on vegetables should focus on the following:
- a) develop early maturing varieties which can survive under extremes of temperature in order to supply the market during the longest possible period in the year;

- b) develop high-yielding varieties adapted to local conditions and suitable for fresh consumption or industrial uses;
- 5) concerning the problems of food processing:
- a) improve oil-producing crops amenable to industrial processing;
  - b) develop procedures to use the by-products of processed crops;
  - c) study the adaptability of certain commodities to refrigeration, freezing and drying;
- 6) concerning insect, disease and rodent control, the following general objectives appear:
- a) survey and classify diseases and harmful insects in Syria and the most effective forms of control;
  - b) identify rodent and worm control problems and their means of control in Syria.

The commodity approach to defining the priorities of agricultural research, then, is predominant in the Syrian agricultural planning documents. These documents contain a strong emphasis on the following commodities:

- 1) fruit;
- 2) vegetable oil crops;
- 3) sugar beets;
- 4) feed grains (corn and sorghum);
- 5) vegetables.

These plans of the MAAR have resulted in the design and initiation of a number of experiments as described in the "Executive Plan for Agricultural Research, 1978-79." These experiments are conducted on the 17 research stations as shown in Table 14. The MAAR has a total of 260 ha. of irrigated land and 963 ha. of rainfed land distributed across these 17 stations. The number and type of experiments for 1978-79 on these stations are shown in Table 15. As might be expected from the countrywide data on the criteria for research, wheat is well represented with 161 of the country's 300 new experiments being devoted to some aspect of wheat production. Budget data are not available to assess the amount of human and financial resources which are being dedicated to different commodities, but certainly wheat is of central importance.

Also shown in Table 15 are other lines of research which have been underway for a number of years, not only in the MAAR but in other agencies which conduct agricultural research, including the GADEB, the Cotton Bureau, the Seed Multiplication Bureau, and the Tobacco Monopoly (more will be said below concerning these non-MAAR research activities). The range of commodities subject to research in Syria is apparently quite large, although we do not

TABLE 14: SYRIAN AGRICULTURAL EXPERIMENTAL STATIONS, MAAR

Station	Mohafaza	Mantika	Stabiliza- tion Zone	Area (ha.)		Principal Enterprise Research Focus
				Irri.	Rain.	
Izra'	Dar'a	Izrau	2	0	100	100
Jellin	Dar'a	Dar'a	1b	0	100	100
Ein el Arab	Sweida	Sweida	1b	25	35	60
Region I: (Dar'a-Sweida)				25	235	260
Douma	Damascus	Douma	4	4	0	4
Karahtha	Damascus	Douma	5	17	0	17
Kharabou	Damascus	Douma	4	12	0	12
Sargaya	Damascus	Bdant	1	13	3	16
Region II: (Damascus)				46	3	49
Homs	Homs	Homs	2	35	0	35
Ghab	Idleb	Ghab	1a	0	84	84
Hama	Hama	Hama	1b	20	20	40
Jableh	Lattakia	Jableh	1a	0	20	20
Region III: (Homs-Hama-Ghab-Lattakia)				55	124	179
Aleppo	Aleppo	Aleppo	1b	9	10	19
Al-Rakka	Al-Rakka	Al-Rakka	4	95	0	95
Deir-ez-zor	Deir-ez-zor	Deir-ez-zor	5	20	10	30
Region IV: (Aleppo-Al-Rakka-Deir-ez-zor)				124	20	144
Al-Hasakeh	Hasakeh	Hasakeh	3	0	110	110
Himo	Hasakeh	Kamishli	1b	0	420	420
Tartab	Hasakeh	Kamishli	1b	10	41	51
Region V: (Al-Hasakeh)				10	571	581
COUNTRY TOTAL				260	953	1,213

SOURCE: Personal field visits to stations, February 1979.

TABLE 15: MAAR 1978-79 EXECUTIVE PLAN FOR AGRICULTURAL RESEARCH

Station	Mohafaza	Total Experi- ments	No. of Experiments Mentioned in 1978-79 Plan										Saf- flow.
			Wheat	Barley	Lentils	Chick- peas	Broad beans	Corn	Sugar Beets	Peanut	Soya flow.	Sesame flow.	
Izra'	Dar'a	39	20	7	4	6	0	1	0	0	0	0	1
Jellin	Dar'a	15	8	0	1	1	1	3	0	0	1	0	0
Ein el Arab	Sweida	0	0	0	0	0	0	0	0	0	0	0	0
Duma	Damascus	1	0	0	0	1	0	0	0	0	0	0	0
Karahta	Damascus	44	29	3	3	3	0	0	2	0	1	0	3
Kharabou	Damascus	10	0	0	0	0	0	10	0	0	0	0	0
Sargaya	Damascus	0	0	0	0	0	0	0	0	0	0	0	0
Homs	Homs	22	13	0	0	X	0	4	4	1	0	0	0
Hama	Hama	24	10	3	0	1	4	4	0	0	0	0	2
Ghab	Idleb	15	10	X	1	0	0	1	2	0	0	0	1
Jableh	Lattakia	7	0	0	0	0	2	4	0	1	0	0	0
Aleppo	Aleppo	36	19	X	1**	1**	1**	1	4	3	0	1	2
Rakka	Al-Rakka	15	8	X	0	0	0	4	2	0	1	0	0
Deir-ez-zor	Deir-ez-zor	30	19	0	1	2	1	0	4	1	0	1	1
Moujarja	Al-Hasakeh	23	14	3	0	2	0	0	0	1	1	0	2
Himo	Al-Hasakeh	16	11	0	3	2	0	0	0	0	0	0	0
Tartab	Al-Hasakeh	3	X	0	0	0	0	3	0	0	0	0	0
TOTALS		300	161	16	14	19	9	35	18	7	5	2	12

Other agencies:

GADEB	X	X	X	X	X	X	X	X	X				
Tobacco Monopoly													
Cotton Bureau													
Seed Multiplication Bureau	X						X	X					

\*\* = in cooperation with ICARDA; X\* = research done in previous years, ongoing.

(continued)



(TABLE 15 cont.)

Station	Mohafaza	Research Conducted by Other Agencies or in Previous Years by Research Directorate						
		Potatoes	Stone Fruits	Citrus	Cotton	Tobacco	Tomatoes	Grapes
Izra'	Dar'a							X*
Jellin	Dar'a							
Ein el Arab	Sweida		X	X				X
Douma	Damascus			X				X
Karahtha	Damascus							
Kharabou	Damascus							
Sargaya	Damascus	X	X					
Homs	Homs		X					
Hama	Hama	X						
Ghab	Idleb							
Jableh	Lattakia		X			X		
Aleppo	Aleppo		X		X			
Rakka	Al-Rakka		X				X	
Deir-ez-zor	Deir-ez-zor							
Moujarja	Al-Hasakeh		X					
Himo	Al-Hasakeh							
Tartab	Al-Hasakeh							
Other agencies:								
GADEB					X		X	
Tobacco Monopoly						X		
Cotton Bureau					X			
Seed Multiplication Bureau		X			X			

\*\* = in cooperation with ICARDA; X\* = research done in previous years, ongoing.

SOURCE: Executive Plan for Agricultural Research, 1978-79, MAAR; and personal field visits.

know the distribution of resources across these different lines of research nor do we have any systematic and quantifiable measure of the results of these programs. Both types of data should be developed to enable the Research Directorate to monitor and assess its research program as well as justify the creation of new research efforts.

### 2.3 The 1977 Agricultural Symposium: An In-House Assessment of Research

The Agricultural Symposium held in early 1977 gave rise to a number of discussions about the nature and future directions of agricultural research in Syria. A set of general recommendations was made as well as some suggestions about specific research focuses.

#### 2.3.1 General Recommendations:

- 1) Form a Higher Council for Agricultural Research that will be mainly concerned with carrying out the following assignments:
  - a) the planning and programming of agricultural research;
  - b) proposing a coordination of regulations and rules that are already or that would be passed; this includes a coordination of activities of the different agricultural research centers; and
  - c) ensuring the completion of agricultural research that is underway and issuing a scientific magazine in which to publish these researches; also, opening an Agricultural Central Library and providing the necessary support for the libraries that are already there in the research centers and other scientific institutions.
- 2) Finance the agricultural research programs in an efficient and consistent manner by setting apart annual funds that equal a percentage of national income and that are based on the budget for the above-mentioned Higher Council.
- 3) Provide special training and other facilities for technicians who are particularly involved in agricultural research (vegetative, animal or economic) by promoting their opportunities for furthering their studies and by opening training courses or increasing the number of scholarships allowed for them.
- 4) Encourage the concerned university teaching staff and the involved personnel on other levels to take up full-time research work, and incorporate this assignment in the Higher Council plan.

- 5) Open several head and branch centers that will be particularly concerned with doing agricultural research (vegetative, animal and economic) and whose work will cover all the environmental regions in the country. These centers will be responsible for implementing the prepared plans, programs and experiments. This will include providing the necessary technicians, equipment, finance, transport and all other research requirements for these centers in order to ensure an efficient performance of their duties.
- 6) Develop research teams for the implementation of different research work whether that be in many disciplines or in one field of specialization.
- 7) Provide the necessary facilities (buildings, equipment, etc.) and the sufficient personnel for the veterinary and agricultural research centers in the country.
- 8) Join efforts with the other Arab countries and international organizations in forming scientific agricultural associations with the aim of exchanging experiences and research results and realizing a coordination of joint Arab scientific research.
- 9) Encourage university graduates and especially those with specialist certificates to pursue their advanced studies. Also, provide them with the necessary scientific research facilities so that they will be able to join research centers after a period of no less than five years of field-work. This period of protected experience will help them have a wider knowledge of the problems related to their specialties.

#### 2.3.2 Recommendations Concerning Specific Themes of Research:

- 1) Land and water research dealing with land classification, water requirements of different crops in different areas, use of saline land, fertilizer requirements.
- 2) Fruit production and disease control.
- 3) Field crops: tillage cultivation and varieties, special emphasis on oil crops, sugar beets, lentils, cotton and corn.
- 4) Vegetable crops: improving year-round availability, counteracting pests.
- 5) Nutrition: use of by-products of food processing, food preservation techniques, development of processing of dairy products and by-products.

- 6) Crop protection focused on olives, potatoes and on controlling the side-effects of pesticides and herbicides.
- 7) Range management research: species for reforestation, introduction of industries involving timber, especially paper.
- 8) Economic and social research: assessing the feasibility of crops by region, the efficiency of machinery, identifying the administrative problems in the agricultural sector and cooperatives, identifying the standard farm size by region, determine the feasibility of processing of certain crops, of poultry, large surface dams, study social changes of different regions and review problems of nomads.
- 9) Animal production: studying the effects of environment and other factors on local and imported breeds of sheep and cattle, and cross-breeds, establishing the advantages and limitations of artificial insemination under Syrian conditions, develop forage plants and storage of harvested materials, assess optimal feeding patterns for livestock, techniques for control of animal diseases.

From these various planning documents, then, the high priority research needs are on paper at least being addressed, although the specific research designs and the results obtained have to be assessed to come to any final conclusions. What is definitely missing from these planning documents, however, is the specific logic which justifies the research needs in terms of national development requirements and aims. The elaboration and specification of such a logic would make future assessments more productive and the guidance of research simpler.

### 3. Research Resources of the MAAR

Sixteen of the Agricultural Experiment Stations of the Ministry of Agriculture and Agrarian Reform were visited during February and March 1979. A five-page questionnaire was developed to elicit basic information about local station facilities and the agricultural research being carried out in each location. Questionnaires were completed during a two-hour personal interview with the Director or the Assistant Director of each station.

Although each station's budget was discussed in general terms, no attempt was made to use this brief interview to survey the financial resources of a station. Outside donor support, however, was discussed in detail. Following the interview, field trials were observed and photographed. Obviously, February and March are not the best times to view most field experiments, but plans were discussed and field experiments identified.

In addition to visiting the Agricultural Experimental Stations, the Deans of the Faculties of Agriculture at Damascus and Aleppo



were visited in early February. The President of the University of Aleppo was also visited at this time. The Director of Research, Ministry of Agriculture and Agrarian Reform, and two Assistant Directors were each interviewed separately as well, as were the Director of ACSAD and the Director General of ICARDA. Information obtained from these various sources was generally mutually supportive, which lends creditability to the information obtained in the brief time span and during the field interviews.

### 3.1 Professionals Working as Agricultural Researchers in the MAAR

The number and training of the professional workers at each of the stations provide an index of the support and activity of each station (see Table 16). There are a total of twelve Ph.D.-trained researchers in the MAAR, of whom seven work in two of the Damascus stations. The Douma station alone accounts for 45 percent of the personnel working in research, which together with the other three Damascus stations add to almost 60 percent of all research personnel.

A personnel questionnaire was developed and sent to various experiment stations for each professional to complete. The data so generated provide details about the research professionals' education, language ability and desire for additional schooling and/or training in an identified area.

A total of 77 questionnaires was returned as shown in Table 16, the bulk being from the Directorate of Research headquarters at Douma just outside of Damascus. The average age of such professionals was 34 years and the average time spent at the present station was 5.6 years. Those at Douma seemed to be more permanent than at the three smaller stations, with average time at the station being 6.7 years at Douma, and 1.3, 3.0 and 3.1 years at the Homs, Izrau and Jableh stations, respectively.

In terms of educational background, it is interesting to note that 9 of the 77 researchers had graduated from an agricultural high school and some had gone on to the university, which means that they were selected as specially apt students in order to continue their studies at the university. Only 20 of the researchers (26 percent) mentioned post-university studies for either an M.S. or a Ph.D., but 35 (45 percent) expressed interest in further study.

Most of the research staff are able to understand English (75 percent) while 35 percent can use French and 25 percent can communicate in a language other than French or English.

Of the 77 people who responded to the questionnaire, just 31 or 40 percent had published the results of their research work. Certainly the adequate utilization of research requires a higher rate of publication.

Finally, the headquarters at Douma apparently attracts a large number of its staff from other Mohafazat (nearly 46 percent were

TABLE 16: CHARACTERISTICS OF A SAMPLE OF PROFESSIONALS WORKING IN THE DIRECTORATE OF RESEARCH AT DOUMA AND THREE EXPERIMENT STATIONS

Characteristics	DOUMA (Directorate of Research)	HOMS	IZRAU	JABLEH	Total
No. of professionals responding to ques- tionnaire:	56	4	6	11	77
Average age:	35	35	28	34	34
Schooling: (no. with each type)					
-ag. high school	8	0	0	1	9
-general high school	48	4	6	10	68
-university	all	all	all	all	all
-post-university	11	2	1	6	20
Interested in further study:	29	0	3	3	35
Languages:					
-English	42	4	5	7	58
-French	20	1	1	5	27
-German	4	0	0	0	4
-Slavic	3	1	1	0	5
-other	7	0	0	3	10
Years at experiment station:	6.7	1.3	3.0	3.1	5.6
If had publications:	22	1	3	5	31
Average distance of home from station:	18.0 km.	6.5 km.	13.0 km.	17.5 km.	16.3 km.
No. born in Mohafaza where station is located:	30	4	N.A.	9	N.A.

SOURCE: Questionnaires circulated by Research Directorate of the MAAR in April 1979.

not born in the Damascus Mohafaza). At the other 2 stations where information was available, 13 out of 15 researchers were born in the same Mohafaza as where the research station was located. Unfortunately, the questionnaire did not enable us to estimate the number of research staff who were from farm families, but in discussions at each station an attempt was made to get an idea of the proportion who had such a background (see Section 3.2).

### 3.2 The Resources of the 17 Agricultural Experiment Stations

3.2.1 Hama: This station, founded in 1973, is located in Hama itself. The primary areas for research at this station are in animal breeding (sheep) and in raising alfalfa forage. Secondary research areas include irrigated potatoes, wheat, barley, corn and fruit trees. About 20 ha. of the 40-ha. station are irrigated and its elevation is 307 m. The annual rainfall is about 400 mm. The station cooperates with ICARDA and the International Potato Center (CIP) in Peru. They obtain wheat and legumes such as broad beans and chick-peas from ICARDA. The buildings used for storage and sheep experiments are in good condition, but there is not adequate office space at the station, with only 5 rooms for 24 (16 professionals) employees. Laboratory facilities are minimal, although teaching facilities are available for students. In cooperation with the University of Aleppo, the station hosts 4 or 5 students for one month each year to study sheep husbandry. The only housing on the station is for the guards. Only limited areas are available for expansion.

The professionals at the station and their educational background are given in Table 17. Four have had farm experience, which relates mainly to experience in raising sheep. The average length of time that the professionals have been at this station is three years. All professionals are conducting field research. No secretaries are employed at the station and there are four full-time, skilled laborers (two are drivers) and fifteen unskilled laborers.

As in the case of several stations, Hama reports difficulty in obtaining part-time laborers, since other departments in the government (such as the Department of Transport, or Telegraph) pay more for work which is not nearly as hard as that in Agriculture. Work in the private sector pays nearly double the amount that the laborers can obtain working for the experimental stations.

Potato research attracts 15 to 20 Agricultural Engineers from throughout Syria for an annual 15-day study period and publications dealing with techniques for growing potatoes for use by farmers have been published in cooperation with the Ministry of Agriculture, Douma.

Most of the Hama station is used for sheep herding, although the irrigated areas are assigned as research plots: 2 ha. for potatoes; 1 ha. for legumes; 1 ha. for wheat; 1 ha. for corn; and 3 ha. for fruit trees. A detailed soil map is not available for the station. Field experiments are designed by the station staff in cooperation

TABLE 17: PROFESSIONAL STAFF OF SAR MINISTRY OF AGRICULTURE EXPERIMENTAL STATIONS

Station	Mohafaza	Education			Education			Total
		Ph.D.	M.S.	B.S.	Inter- mediate	Ag. High School	Gen. High School	
Hama	Hama	1	11	1	1	1	1	16
Aleppo	Aleppo	1	1	14	0	1	1	18
Rakka	Al-Rakka	0	0	1	0	0	0	1
Deir-ez-zor	Deir-ez-zor	0	0	1	0	2	0	3
Jableh	Lattakia	3	1	15	3	1	0	23
Ghab	Idleb	0	0	1	0	2	0	3
Douma	Damascus	6	4	82	1	12	0	105
Karahtha	Damascus	1	0	13	1	1	0	16
Ein el Arab	Sweida	0	0	3	0	5	0	8
Izrau	Dar'a	0	0	6	1	2	0	9
Sargaya	Damascus	0	0	0	0	1	2	3
Moujarja*	Al-Hasakeh	0	0	2	0	0	0	2
Himo*	Al-Hasakeh	0	0	0	0	0	0	0
Tartab*	Al-Hasakeh	0	0	0	0	0	0	0
Homs	Homs	0	1	3	1	2	1	8
Kharabou	Damascus	0	2	8	1	1	0	12
Gillian	Dar'a	0	0	1	0	1	0	2
TOTALS		12	20	151	9	32	5	229

\*Stations operated by the same professionals.

SOURCE: Research Directorate, MAAR (1979).



with staff at Douma. Experiments last for one year except fruit tree research. Most field equipment is in fair condition, but a 100-h.p. tractor and small equipment for doing plot work are needed. The irrigation equipment is good and adequate water is available for irrigation studies. The weather station equipment is adequate and provides four 6-hour observations daily to the National Climatology Network. In-service training is provided to all professionals for one or two weeks per year. Several have attended the 4-6 month training sessions at ICARDA.

3.2.2 Aleppo: The headquarters of this station is located in the outskirts of Aleppo, in the Cotton Bureau Laboratory Building, with the experimental plots located 14 to 32 km. outside of town. Three parcels of land are operated by the station, with a total of 9 ha. for dryland and irrigated research. The elevation of the station is about 400 m. The primary research area for the station is pesticides, mainly through greenhouse and laboratory work. Secondary research areas are wheat, barley, maize, sugar beets, soybeans and stone fruits. The average annual rainfall on the station is 380 mm. and about half the area is devoted to irrigated agriculture and the rest to dryland crops. This station was established in 1960.

ICARDA has cooperated on wheat and barley experiments. FAO is also cooperating in pesticide studies. The station cooperates in teaching for the local Intermediate Institute and has about 150 students for the summer for both laboratory and field studies. There is no housing on the station, and very limited area is available for expansion.

Advanced degrees on the professional staff (see Table 17) include one Ph.D. in plant pathology from France and one M.S. in statistics from Egypt. Two of the professionals are from farm families. Three of the professionals teach part-time at the University of Aleppo, which is unusual for experimental station workers. All professionals are conducting field research, but no publications have resulted for farmer use. No secretaries are employed at the Experimental Station, but they employ 4-6 full-time unskilled laborers.

The station has 2.8 ha. for nonirrigated and 2.8 ha. for irrigated studies on wheat and safflower. They also have 6.5 ha. for nonirrigated and 6.5 ha. for irrigated soybeans and maize research. Detailed soil maps of the experiment station are available from surveys done in cooperation with ICARDA. Field research is usually designed by Douma personnel and fieldwork conducted by the local staff. Research is reviewed annually by staff from Douma.

The laboratory equipment is in good condition, but equipment for field experiments is only in fair to poor condition. A large (100 h.p.) tractor and a small tractor for tree fruit work are needed along with the tillage equipment for each. Two vehicles are needed, a land-rover (type) and a micro-bus for moving personnel between stations and within the stations. A satisfactory

sprinkler system is available for irrigation studies, and weather station equipment provides 24 hourly observations to the National Climatology Center.

In-service training is provided for their personnel by the Ministry of Agriculture in Douma.

3.2.3 Rakka: Located in Al-Rakka, the primary focus of research at this station is fruit trees with secondary emphasis on wheat and barley. The station has an area of 120 ha. and elevation of 250 m. Its annual average rainfall is about 250 mm. and the research conducted is under irrigated conditions. The station was established in 1958 and has been the main MAAR research station for the Euphrates Valley irrigation studies; 25 ha. of this station's land has been assigned to the Ministry of the Euphrates Dam for agricultural research. No wheat or barley research will be conducted in 1978 or 1979 due to canal construction. Fruit tree research, however, has not been affected by canal construction. After the construction is completed, there will again be areas available to expand agricultural research.

The buildings of the station are generally in good condition, but the office space needs maintenance. No laboratory facilities are available.

The Rakka Station cooperates with the Soils Institute at Rakka in training 3 or 4 students. Three families are housed on the station but not any of the professionals.

One of the staff professionals comes from a farm family. There is no secretary employed on the station, but there are 5 skilled and 15 unskilled full-time laborers. The station has difficulty hiring the 10-12 part-time employees due to the Ministry of Agriculture's wage scale.

Of the station's land, 15 ha. are devoted to fruit trees, 2 ha. for wheat, 1 ha. for barley and .5 ha. for tomatoes. A detailed soil map of the station will soon be available. A tractor for working the fruit tree area is necessary with the necessary tillage equipment. A fertilizer spreader is especially needed. A land-rover and a micro-bus are needed for transportation. The irrigation equipment is in good shape and when the Rumanians finish the canals, the studies will resume on wheat and barley. The weather station equipment is an agrometeorology center and has complete data on all normal weather data for meteorology studies. The station cooperates with the University of Aleppo and has many students from the Agricultural High School and Intermediate Institute during the summer. Fifteen students worked and studied at the station for one month in 1978.

3.2.4 Deir-ez-zor: The primary area of research for the Deir-ez-zor station concerns salinity problems of crop production and methods of drainage necessary to build a permanent agriculture. Soil moisture retention and tiling systems are also being studied.

The area receives about 170 mm. of rainfall annually and its elevation is 203 m. Time did not permit a visit to this station, so details of its operation are unavailable.

3.2.5 Jableh: Located in Jableh in Lattakia Mohafaza, this facility specializes in research on citrus fruits with a secondary emphasis on vegetables. FAO is cooperating on citrus research in a study that deals primarily with citrus diseases.

The station has an area of about 20 ha., an elevation of 14 m., with an annual rainfall of about 800 mm. Since the station was established in 1972-73, research has been conducted under irrigated conditions. The buildings are in good condition, but there is not enough office space. No machine shop facilities are available, and the laboratory is small for the kinds of analysis desired. No housing is available on the station, but is badly needed, as well as office and laboratory space.

Teaching is an important function of the station. Cooperation with both the University of Aleppo and the University of Lattakia is undertaken. Students spend ten days here each summer. During the interview a class was present on a three-day training session from the University of Lattakia.

Two of the Ph.D.s on the staff were trained in France and one in Russia; one M.S. was received in Egypt (see Table 17, p. 34). Of the 15 agricultural engineers at the station, 9 are female. Two of the professionals have had farm experience. Four secretaries are employed at the station, and 5 full-time skilled men. However, the station has difficulty in hiring the 15 part-time laborers since there is no nearby village, which usually means that only older workers are obtained.

The professionals with postgraduate studies have 15 agricultural engineers to assist them with their field research. Three help with pathology studies, 3 with stone fruits, 4 with citrus, 2 with entomology, and 2 with vegetables. Meetings are held with farmers concerning citrus and olives in October and vegetables in the summer. There is presently no contact with extension personnel.

The fruit tree research is planned in Douma, while citrus studies are planned here and approved by Douma. All have an annual review by Douma personnel.

Of the 20 ha. used for field experiments, 8 ha. are used for citrus, 2 ha. for vegetables, 6 ha. for stone fruits such as peach and cherries. This experiment station was one of a few that had a detailed soil survey map that had been completed by the Soils Directorate in 1974. Average length of their field experiments is four years. They cooperate with the Department of Tobacco on field research and with ICARDA on herbicide studies on legumes. Their field equipment is in good condition, but they are in need of fertilizer spreading equipment and rotary tillage equipment. They are cooperating with the Soils Directorate at Douma on an experiment



using organic fertilizer for potatoes. Their irrigation equipment is adequate and their weather station equipment is good and operated by the Climatology Department for Agriculture. FAO has provided laboratory equipment for the pathology group, but laboratory facilities and equipment are needed for fruit tree research.

The station has a good working relationship with both the University of Aleppo and the University of Lattakia, and cooperation in research with ICARDA, Tobacco Monopoly, Soils Directorate and FAO. Four or five technical school students spend two weeks at the station during the summer. In-service training involves two weeks' training for new agricultural engineers.

3.2.6 Ghab: Several experimental locations are situated within the Ghab Valley near the Orontes River in Idleb Mohafaza. This important agricultural area has had studies done here since 1952, with a major input from FAO in the early 1970s. The major research in this region concerns wheat and barley with chick-peas and safflowers also being studied. The 84-ha. station has an elevation of 170 m. with an average rainfall of 650 mm. Here drainage studies and related salinity problems have been a major part of the research. Open ditch drainage and the clearing of trees along the drainage ditch were being accomplished during the time of our visit. The rate of decomposition of this high organic soil has been studied and needs additional attention. The obviously high water tables in this area make water management studies a high priority item.

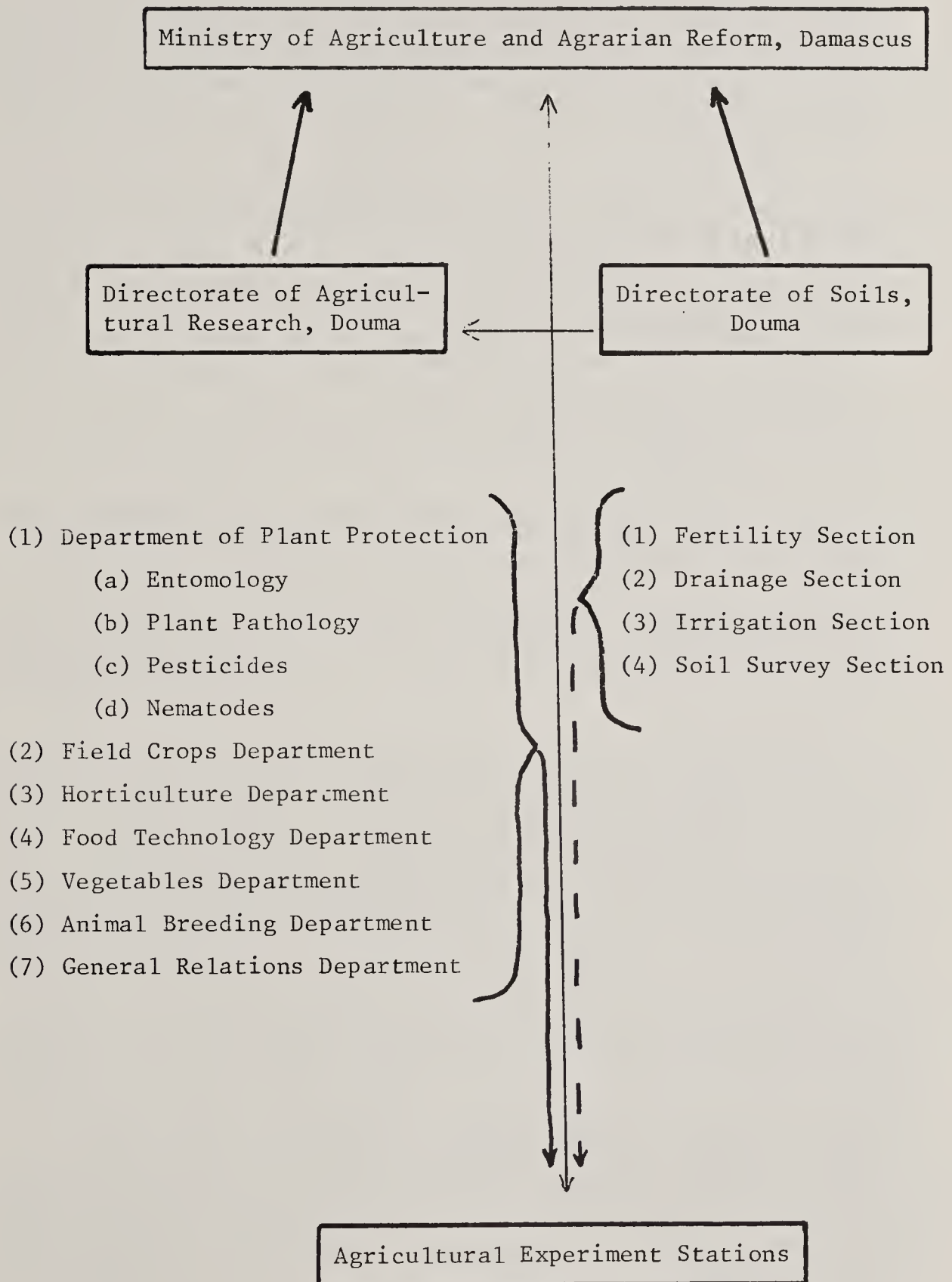
The buildings at the station visited were in very poor condition and the weather station equipment was in need of maintenance. The tractor is old and all field experiment equipment needs to be replaced. Only day-workers were available for interview at this station, so details of its operation were not obtained. The winter wheat experiments, however, looked well-handled. It was some of the best wheat that we saw at any of the experiment stations.

3.2.7 Douma: This experiment station is located just northeast of Damascus. The station serves as the Headquarters of the Ministry of Agriculture and Agrarian Reform Research Directorate, but it has only 4 ha. devoted to field research. Its elevation is 700 m. Primary field research at Douma relates mainly to stone fruits, cherries, grapes and olives. The average rainfall for this irrigation station is 200 mm.

Although the land area at Douma for field experiments is limited, it is complemented by a new modern greenhouse. This 40 m. x 13 m. greenhouse employs many new ideas and techniques. The humidity, light and air conditioning controls in some of the separate rooms have not been adjusted so research had not been started as of March 1979. The unique shutter arrangement to provide shade for the individual sections of the greenhouse should make it a much more energy efficient research greenhouse than most. Some of the ideas incorporated into this greenhouse have not been used in other parts of the world and may encounter some difficulty initially in growing plants for research studies. Until plants have been grown in the



FIGURE 2: ORGANIZATIONAL STRUCTURE, SAR MINISTRY OF AGRICULTURE AND AGRARIAN REFORM, DAMASCUS, SYRIA



facility for at least 12 months, no one can predict exactly how successful it will be. However, once experience is accumulated, all departments should be urged to make full use of it since both the facility and the location make it very attractive for research studies.

In addition to its role as headquarters for the MAAR Directorate of Agro-Scientific Research, it is also the headquarters for the Directorate of Soils. It also provides the headquarters facility for the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD). Thus the concentration of agricultural professionals at Douma is not matched anywhere in Syria and perhaps nowhere else in the entire Middle East. The lack of communication and interaction between the Directorate of Agro-Scientific Research and the Directorate of Soils, however, is very disappointing. There also appears to be little communication between the professionals at the Arab Center for the Studies of Arid Zones and Dry Lands and professionals with similar interests in the Ministry of Agriculture. Both are conducting field research on complementary projects at the Izrau Experimental Station near Dar'a, but little interaction between these groups could be found either at Douma or at Izrau. An exception to this statement, however, is in the soil survey work now being carried on by ACSAD and the Soil Survey group in the Directorate of Soils.

The area available to the Douma station limits any expansion plans for most field research there. Expansion, at any rate, should be for offices, laboratory or greenhouse facilities.

3.2.8 Karahta: Located just east of Damascus, primarily wheat breeding research is carried on at this irrigated station. Its area is 17.5 ha., elevation 617 m., and the rainfall averages about 160 mm. annually.

This is one of the 10 stations now carrying on wheat research. The main objectives of this research are: (1) to find suitable varieties and evaluate varieties from a worldwide selection; (2) to have a breeding program to improve the varieties; and (3) to improve imported varieties from CIMMYT, FAO and any other source. Wheat varieties are first tested here and then taken to other stations to follow a 5-year testing sequence to produce the best variety and seed for the government Seed Organization, which in turn increases the seed stock and then provides the seed to farmers. The wheat breeding program was started in 1974-75 with some 2,000 wheat varieties. They now are in the fourth generation and have made 500-700 crosses. They are improving breeding and selection and have used 5 local varieties. One variety has been developed (called "Hourani") that is rated as being very good, since it is drought resistant, shorter and resistant to black rust. The varieties they have selected are 60 percent hard varieties and 40 percent soft (necessary for local bread requirements). Some of the new varieties are in the fourth generation and are giving a yield of 6-7 tons/ha.

Since the site of the experimental facility is located close to Douma practically no housing has been constructed for personnel. There is also little equipment storage and few offices. This experiment station has productive soils that respond to irrigation, but no detailed soil survey has been made nor has mapping been completed.

3.2.9 Ein el Arab: This station is located in the mountains east of Suwayda. The station is concerned with research into grapes and apples. Less important is the research in stone fruits such as peaches, plums and almonds. The area of the station totals 60 ha. at an elevation of 1,550 m. The average annual rainfall is 500 mm.

The station was established in 1959. General conditions of the buildings, office and laboratory space are poor and no machine shop facilities are available. No housing is available on the station. Area for expansion is available, especially for offices and laboratories. The station needs two low tractors that can work under the trees in the orchards, and transportation vehicles since the station is located some distance from any city.

All of the professionals on the station staff (see Table 17, p. 34) are from farm families and have farm experience. No secretaries are employed, but there are 7 full-time laborers, 3 skilled and 4 unskilled. The station has difficulty in obtaining their 7-10 part-time employees, since they can only pay about one-third of the going rate of the private sector. The average time the professionals have been at the station is 2 years. All are conducting field research and 5 University of Damascus students have been trained every year. All research is reviewed by the Horticulture Department at Douma.

The field areas are all irrigated and 7.2 ha. used for grape research, 12.5 ha. for apples and pears, and 5.5 ha. for peaches and plums. A detailed soil survey of the mountains in this area was made in 1978, but the detailed soils map is not available at present. Research studies are reviewed annually for the fruit trees, but established trees are continued for a minimum of 5 years. Close cooperation is carried on with the Plant Protection Department. Seven varieties of apples are being used in a comprehensive storage study.

The station does not have any direct connection with any university or technical school. The in-service training is provided by the professionals going to Douma for a week or 10 days each year.

3.2.10 Izrau: The Izrau station is located in the Dar'a Mohafaza. Research is primarily centered on wheat and barley with secondary research areas being lentils, chick-peas, corn and, most recently, grapes. The area of this station is 100 ha. and its elevation is 575 m. The average annual rainfall is 290 mm. with a 320 mm. maximum. This station was established in 1949 and conducts dryland research only. The Arab Center for the Studies of Arid



Zones and Dry Lands has an office building on this station, and field equipment is used cooperatively. The offices for the Experiment Station and the Agricultural Affairs for this area are located in the same building, which makes conditions very crowded. There are no machine shop facilities, but the Canadian project (IDRC) is planning to build a laboratory and storeroom in 1979. Laboratory equipment is needed although the Canadian project has provided ovens and scales. The field equipment is old and the 1960 tractor needs to be replaced. Tillage equipment and seeders are also needed. The weather equipment is operated by ACSAD and provides four 6-hour observations daily. Adequate area is available for expansion. Housing is needed at the station for the professional staff.

One of the staff members is presently at ICARDA involved in a training program. The in-service training has been at the station or with ICARDA. Agricultural college students from Damascus come to the station for training. Nine of the professionals (see Table 17) are from farm families and have had farm experience. No secretaries are employed at the station, but they have 5 skilled and 4 unskilled full-time employees.

The research conducted is decided by the Field Crops Department at Douma and reviewed annually. The research areas assigned by the station director to the crops for research are as follows: .5 ha. for barley, 2 ha. for wheat, 2 ha. for lentils; chick-peas and maize have 1 ha. each, and 3 ha. are assigned to grapes. This is one of the few stations where research conducted by the Directorate of Soils, Douma, was found. Studies on the fertilization of lentils and wheat also are being conducted.

Station researchers are doing a study on the mechanical harvesting of legumes with ICARDA, and also research about the impact of fertilizer on legumes and wheat. ICARDA in this case does all the work, including planting and harvesting, and they provide the yields to the station. They bring their field equipment to the station and also use it throughout Syria on their experimental locations. The station has had a detailed soil survey made by ACSAD.

3.2.11 Sargaya: This experimental station was founded in 1960 and is located in Bdant Mantika near the Lebanese border. The primary research concerns pears and apples with a secondary effort in cherries and potatoes. The area of the experiment station is 16 ha. and its elevation is 1,400 m. The annual rainfall is 525 mm. Irrigated research is conducted at Sargaya station, the water coming from wells at 60 m.

The buildings at the station are in good shape but no laboratory is available. There are plans to build one in the near future. The station has two tractors, one good and one bad. A low-type tractor is needed that can work beneath the low branches on the fruit trees. The irrigation equipment is in good shape.



Until 1978 the station was operated by the Agricultural Affairs Center, but now the station is operated by the Research Department at Douma. Students from the Intermediate Institute in Damascus and 15 from the College of Agriculture of the University of Damascus benefit annually from the teaching activities of the station. Housing for the director is available on the station.

The three members of the professional staff (see Table 17, p. 34) are from farm families and have had farm experience. No secretaries are employed but 19 skilled laborers are employed full time; 15-20 part-time employees are employed, but they are difficult to hire since they can pay only one-half of the private sector wage rates.

Research is directed by the Horticulture Department at Douma. Of the 16 ha. for research, 1.2 ha. are assigned to pears, 5.5 ha. to apples, 1.2 ha. to cherries, and 5 ha. to potatoes, which research has just been begun. The soils of the station have been surveyed, but no soils map is available. The weather equipment is operated by the military and four 6-hour observations are made daily. They include normal measurements, plus soil temperatures at 5, 10, 20, 50 and 100 cm.

3.2.12 Moujarja: This 110-ha. station is in Al-Hasakeh, and is concerned primarily with dryland wheat, as well as fava beans, legumes and crown vetch. Of secondary interest are various stone fruits. The average annual rainfall is about 300 mm.

The stone fruits in the area need attention especially in pruning. Wheat varieties from Karahta experimental station are also tested here to compare their yields and adaptability. No breeding program is carried on here. The office buildings are good, but shop facilities are poor. There is room for expansion on the station. The weather station provides eight 3-hour observations daily. The station is supervised by the same professionals (see Table 17) who operate the Himo Experimental Station in Kamishli (see below). The distance between Kamishli and Hasakah is great enough to make close supervision of the research on both farms difficult, even though the finances of this station are handled through Hasakeh Agricultural Center at present, making weekly trips to Hasakeh a necessity in spite of the great distance involved. If the financing system were to be changed the trip would be made less often and perhaps supervision on each farm would improve. Professionals responsible to the Directorate of Agricultural Research should be located at Hasakeh Experimental Station.

This center is operated out of the Agriculture Center in Hasakeh. While visiting the Agriculture Center we met our first extension agent. This woman extension agent returned to her home city of Hasakeh to work with the farm families, and especially with the women to see if they can be convinced to use newer farming techniques. No soil survey has been made of the station and no map is available.

3.2.13 Himo: This station is in Kamishli which is also located in the Al-Hasakeh Mohafaza. Primary research at this station is concerned with wheat and includes rotations, both with and without a fallow of wheat and legumes (crown vetch, alfalfa and berseem clover). The 420-ha. station has an elevation of 542 m. The average annual rainfall for the area is 450 mm. The station has cooperated with FAO for many years and an FAO agronomist has been stationed here for the past 5 years. A technical school is located on the grounds and a shop class was repairing motors when we visited it. Relations between the school and station seemed to be minimal.

There is research in cooperation with ICARDA relating to wheat plots with fertilizer variables. New seeding equipment and varieties are needed.

Rainfall is unpredictable and the dryland operation with fallow does not seem to be as beneficial as some expect. The buildings are in fair condition, but need laboratory space. There is substantial space for expansion. The machinery is in very poor shape. They need plot equipment that is small and not too mechanized. Two vehicles such as a land-rover and a mini-bus are needed as well. Transportation is needed for professionals and even workers, since the station is about 8 km. west of Kamishli and no public transportation is available. Housing for the professionals is greatly needed on the station since satisfactory housing in Kamishli is difficult to obtain. Children would have to be transported to Kamishli for schooling, since there are no schools between Himo and Kamishli. The same professionals operate Himo as the station at Hasakeh.

3.2.14 Tartab: The Tartab station is also located in Kamishli. The primary research concerns of this station are the stone fruits, with seed wheat fields as well. This 51-ha. station has an elevation of 540 m., and has an annual average rainfall of 450 mm. The professional is the same as that listed for the Himo Experimental Station and for Hasakeh. This irrigation station is new and is used as a seed wheat field for varieties that the Field Crops Department has found to be useful in its testing program at Himo and 9 other stations. Many nursery plantings of stone fruits have been made within the last year. These include almonds, pistachios and grapes. The irrigation is very necessary and is somewhat dependent on the amount of water coming down the small river adjacent to Turkey. Expansion of any irrigation studies on this station seems to be very risky since the entire water supply could be completely shut off by Turkey in a very dry year. Close cooperation with FAO for the past 5 years has helped to broaden the outlook of this rather isolated station. No soil survey has been made of the area.

3.2.15 Homs: The Homs station is located about 4 km. from Homs. Research at this station is primarily concerned with vegetables, especially tomatoes, melons, cucumbers and onions. Secondary research areas include fruit trees and wheat. Established in 1978, this 35-ha. irrigated station is the newest of all the experiment stations visited. The average annual rainfall at this station is

about 300 mm. The buildings are new and there is a laboratory for processing horticultural crops and a laboratory for herbicide and pesticide studies being constructed. Office space is crowded at present, but the crowding should be relieved when the present building program is completed. There is no housing on the station for the professionals, but there is room for expansion. All of the professionals (see Table 17, p. 34) have had farm experience and two come from farm families. No secretaries are employed and there are 4 unskilled laborers. There is difficulty in hiring 14 part-time laborers even for 4 months since only 50 percent of the private sector wages can be offered and thus the station has to hire women who will work at a cheaper rate (S.L. 10/woman vs. S.L. 17/man).

The research to be conducted at the station is decided at Douma and reviewed annually. The 35 ha. used for irrigated research is assigned as follows: vegetable crops have 1 ha., fruit trees use 8 ha., wheat uses 2.5 ha., melons use .75 ha., sugar beets use .25 ha. and chick-peas have .5 ha. The Directorate of Soils has surveyed the station, but the detailed soils map is not completed. Research is also being conducted in cooperation with the Directorate of Soils, Douma, and with ICARDA. Chick-pea varieties are supplied by ICARDA and grown by the experiment station and the results provided to ICARDA. The station has new equipment but in limited amounts. Laboratory equipment is needed as well as tillage implements for their tractor. A small tractor is required to work under fruit trees as well as a sprayer. Two vehicles, a pickup truck and a four-wheel drive, are needed as well. The irrigation equipment operative on the station is good and a very adequate supply of water can be obtained from the Orontes River. A weather station is located across the road from the station and provides four 6-hour observations daily.

The station is not connected with any university, but the Agricultural Technical Schools plan to use this station for training. They plan to provide training to secondary school students for 1 or 2 months during the summer through work on the station. The in-service training for station professionals is provided at seminars at Douma.

3.2.16 Kharabou: This station is located in Douma Mantika and is primarily concerned with research into maize. The center of this 12-ha. station is located on University Experimental Farm with another 10 ha. as a breeding field nearby. It has an elevation of 600 m. and an average annual rainfall of 200 mm., and was established in 1972 as an irrigated maize research station.

Three members of the staff have farm experience. No secretaries are employed but there is 1 skilled laborer. The station employs 20 skilled and 20 unskilled part-time laborers during the growing season although these are difficult to obtain since only two-thirds of the wages of the private sector are paid. Of the 8 professionals conducting field research, 2 are teaching plant breeding and statistics at the University of Damascus. Thirty students from



the College of Agriculture, University of Damascus, visit the station twice a year. Ten students also visit from the Intermediate Institute, and 12 agricultural engineers come for training courses ranging from 7 to 20 days during the growing season. A Maize Culture Bulletin that is being used by farmers has been published. The basic research is usually for a 3-year period, with some studies extended for 5 years. This is the only experiment station that had a soil fertility study which indicated a joint research effort between the Directorate of Soils, Fertility Section, and the Field Crops Department of the Research Directorate.

Once a year a field day is held at the station at which time all those interested in growing corn are invited.

Needed is basic equipment for plowing and tillage, and a corn planter for experimental work. A laboratory building is presently under construction.

The weather station equipment is a part of the national Agrometeorology network and records and reports all needed weather information.

International cooperation continues with both FAO and CIMMYT. Their in-service training involves working with international centers like CIMMYT and FAO.

3.2.17 Jellin: The Jellin station is in Dar'a Mantika. Research is primarily conducted on wheat although there are projects in maize, lentils, chick-peas and vetch. This 100-ha. dryland experiment station was established in 1977 and is located at an elevation of about 550 m. with an average annual rainfall of 400 mm. The station has received a 3-year support grant (\$245,000 total) from the Canadian International Research Center (IDRC).

There are presently no buildings other than one combination shed that is used as an office, preparation area and storage shed. Expansion area is available for building. Experimental equipment for operating field plots is needed in addition to buildings. The station is operated at present as a sub-station of the Izrau station. Both members of the station's professional staff (see Table 17, p. 34) come from farm families and also have farm experience. They have no secretary or full-time laborers, but hire several part-time laborers, generally women. This is the only station to report no trouble in hiring laborers. Lack of employment in the private sector due to the isolated location of the station may be the reason.

The research areas assigned at present are as follows: wheat uses 9 ha., maize uses .5 ha., lentils uses .5 ha. plus another .5 ha. for studies in mechanical harvesting, chick-peas and vetch have .25 ha. each for research studies. Field experiments are designed by the Field Crops Department and cooperate with CIMMYT, FAO, ICARDA, and ACSAD. Rotations are a part of the detailed research, with two 6-year rotations using both a winter and a summer cropping sequence. This is compared to an intensive cropping pattern which



includes two crops of wheat, then a crop of either legumes, chick-peas, millet or vetch. Fertility studies with nitrogen and phosphorus variables are being conducted on wheat. Potassium and nitrogen are being studied in lentil experiments.

No laboratory equipment is available at the station. The weather station is reporting four 6-hour observations daily.

#### 4. Agricultural Research in Agencies Other than the MAAR

##### 4.1 The Euphrates Project

The Ministry of the Euphrates Dam also has responsibility in research concerning the land and water now becoming available in the Euphrates project. The agricultural research of the Ministry of the Euphrates Dam is concerned with the utilization of the waters in the irrigation of a projected 640,000 ha., as well as the conversion of unused arid land to irrigated land.

Experimental farms have been established in the project areas representing the major land types of Balikj Basin and the Euphrates Valley. Different agricultural tests have been carried out in these experimental farms so as to answer the most urgent questions, namely: (1) the determination of water modules for reclaimed lands in the Balikj basin, after calculating the water requirements of the crops involved in the crop rotations which are being proposed for these lands; (2) solutions to the salinity problems which plague these lands, and to discover what measures need to be taken for their reclamation and to elaborate programs for these purposes; (3) the determination of arable gypsiferous soils in case of high gypsum content exceeding the limits of cultivatability set by the consultant companies; (4) the exploration of the possibility of introducing new areas of the Volcanic Region into cultivation in spite of their exclusion from that purpose by companies which have carried out the studies related to the Balikj Basin; (5) the determination of crop patterns for the new lands and the assessment of their potential for success in the area; (6) the selection of crop rotations for the Reclamation Area and the calculation of their expected income and revenue; (7) the determination of needed quantities of fertilizers for the various crops which have been determined to be successful in the area; (8) the determination of optimal sowing and harvesting dates and the creation of technological charts for the crops; (9) the application of high levels of mechanization as regards the main crops; and (10) the establishment of the best use of herbicides and insecticides for plant protection.

The Ministry of the Euphrates Dam has the following locations devoted mainly to applied research or demonstrations on a field scale:

4.1.1 Najid (Billanah): This 80-ha. station has been divided into 13 4-ha. farms and this irrigated land is used principally

for estimating water requirements of riverbed and plateau soils when used in general crop production, including vegetables, maize, fruit trees and legumes.

4.1.2 Rakka: This 25-ha. station is located on land loaned by the Rakka Ministry of Agriculture Experiment Station and serves as the main experiment station for the Euphrates Dam. Studies have been done concerning fertilizers for wheat, cotton, corn; variety studies for wheat, lettuce and corn as well as experiments to determine planting times, and projects concerning cotton mechanization and upright tomatoes. Little research activity presently seems to be underway, which perhaps indicates a reevaluation of the applied research at this station and what new direction to be taken.

4.1.3 Gournata: This 27-ha. station has 18 ha. devoted to cotton research and to the development of gypsiferous soils under irrigation.

4.1.4 Mankher, 10 ha: This station is located on the volcanic soils of the Lower Euphrates and is mainly devoted to the water and crop interaction with such soils.

4.1.5 Korbatiya: This 10-ha. farm is presently a forestry nursery.

4.1.6 Khatoumah: This 10-ha. farm, located near the city of Rakka, is dedicated to research on saline soils and crop production.

The GADEB organizes research on these six stations by having agricultural engineers with special training live in Rakka and go to the station as needed. These engineers are responsible for the design of the experiments, their supervision and the writing of the reports about the results obtained. Post-B.S. training has been obtained through (1) on-the-job work with international agencies at the Euphrates project, (2) short courses abroad, and (3) graduate study abroad. The 15 engineers in this category include a Ph.D. in land reclamation, an M.S. in land reclamation, a fertilizer specialist, a drainage specialist and an irrigation and water management specialist. Three other agricultural engineers live at the station and directly supervise the experiments. In addition, there are 11 assistant agricultural engineers, who are graduates from the 2-year Intermediate Institute for Land Reclamation managed by GADEB in Rakka, and who are largely responsible for the implementation of the research. Most live on the pilot project farms and travel to the stations nearby as needed.

In summary, GADEB agricultural research in practice has focused on three main themes: (1) water requirements of different crops in different soils; (2) methods of irrigation; and (3) fertilization and pest control. The results of research go to the Planning Department of the Agricultural Sector of GADEB and then to the Agrarian Affairs Department for introduction into the farming practices carried out in the 15 pilot project farms. Principal results are

also published in the annual "Report of the Results of Experiments and Agricultural Research, GADEB." Some coordination of research with the MAAR occurs, but mostly on an ad hoc basis. The only contact with university staff has been concerning the design of a radioisotope soils research project proposed by the Faculty of Agriculture at the University of Aleppo. To date the most significant results of the GADEB research program in terms of its international implications have been the work on gypsiferous soils productivity, which irrigation methods are more successful on such soils, and the water requirements of such soils.

#### 4.2 Research in the Cotton Bureau

The Cotton Bureau was formed in 1952 and presently is a semi-autonomous agency of the Ministry of Agriculture and Agrarian Reform. Its headquarters are located in Aleppo, which is the geographic center of the cotton growing and ginning region in Syria. The Bureau's functions are: (1) to carry out experimentation oriented to developing more adequate cotton varieties; (2) to control the quality of the cotton produced; (3) to supervise the ginning and marketing of cotton (the Bureau supervises the Cotton Marketing Organization); (4) to oversee the growing of cotton.

The research program of the Cotton Bureau has a reputation for being a successful one. This reputation is well founded if only from the point of view of the increased production which has resulted from the increased yields of the varieties developed and introduced into Syrian agriculture since 1971. In that year, "Aleppo 1" was introduced and five years later yields of the areas planted in cotton with this new variety had increased by nearly 44 percent. Both new varieties and growing methods are the subjects of experimentation by the Cotton Bureau's research staff. A new variety, "Aleppo 40," is being introduced presently.

The factors which have contributed to whatever success this research has achieved are difficult to ascertain, but at least in part the research program has been able to attract professionals and conduct long-term investigations which have been made possible by an independent financial and administrative apparatus. The Cotton Law gives the authority to the Cotton Bureau for research as well as the other aspects of cotton growing and marketing. Only one-third of the Bureau's financing comes from the MAAR, mostly for fixed yearly costs. Two-thirds of the Bureau's budget comes from the Cotton Festival Committee which in turn receives most of its financing from its 3 percent share in the National Lottery.

Another unique feature of the research system of the Cotton Bureau is the fact that most research plots (2-5 ha. each) are rented from farmers in different areas where cotton is grown. Cotton is repeatedly planted on these plots year-after-year to reproduce the most unfavorable conditions as far as pest management is concerned so that techniques for controlling these problems can be developed for each variety being tested.



This method of land rental also means that no infrastructural investments are made on the research stations, except for some minimal housing for the site supervisor from the time of the planting to the harvest. These supervisors are all graduates of the agricultural secondary schools, since the research managers feel that the graduates of the universities are not sufficiently oriented toward practical work and cannot be retrained easily in the hard work techniques of cotton research. The site supervisors receive their regular salary plus an incentive payment of 100 percent of that salary while they are on the site. At the end of each season there are awards granted for superior research work. Such awards act as incentives even though the quantity of money is more symbolic than real.

The organizational lessons to be gained from the research work which the Cotton Bureau has stimulated are significant, particularly the benefits derived from a decentralized decision-making apparatus with relatively autonomous control over its own research funds. The flexibility of such a system contrasts in many ways with the research management system of the MAAR and should be studied as a model for "modern regulations" to guide and stimulate agricultural research in any new institutions which may be created.

#### 4.3 Research in the Faculty of Agriculture at the University of Aleppo

The main problem with developing a viable research program in the Faculty has been the dramatic increase in undergraduates from some 200 only 15 years ago to over 2,500 today. This buildup in enrollments has put a severe strain on both the teaching staff and the physical plant. This legacy of the open university policy has yet to be completely balanced with adequate staff to handle the many aspects of course, study body and staff administrative procedures.

Many improvements in the situation have been made recently. A new building is to be available to the Faculty of Agriculture this coming year. The staff size is reaching adequate levels (65 professors and 20 laboratory assistants), and some limitations on the number of incoming students have been put into effect so that at the least the number of new students each year has stabilized. The Faculty has embarked on a limited Masters degree program (begun 6 years ago) for 6 students via first a diploma granted for one year's postgraduate study. The specializations currently offered are in field crops (in the Agronomy Department), fruit trees (Horticulture) and irrigation and soil reclamation (Soils), the latter in conjunction with FAO, the Ministry of Agriculture and ICARDA. The preparation of postgraduate courses of study makes an adequate research program mandatory. The costs of such a program have obliged the university to go slowly with the postgraduate program; each diploma costs about 75,000 S.L. for teachers' salaries alone. Currently there are four research projects underway. Each is being carried out in conjunction with international agencies, although national resources should be more available in future years.



One project concerns the use of radioisotopes in research on water movement in soils of various types, in conjunction with the International Atomic Energy Agency. A second research project focuses on the control of cotton pests, in conjunction with FAO where Syria is one country in a multicountry project. A third project has been developed with ACSAD concerning range management and has as its principal objective the collection and reproduction of desert plants from the low rainfall areas of Syria, Jordan, Saudi Arabia and other nearby countries. These species are studied for their adaptability to a variety of environmental conditions. Seeds are reproduced and presently sent to a number of countries which are attempting to reestablish range cover, including the United States. A fourth project, again jointly developed with ACSAD, is concerned with the production and disease problems of the pistachio. As ICARDA becomes more established, collaborative research projects will be developed.

#### 4.4 International Center for Agricultural Research in Dry Areas (ICARDA)

Since ICARDA became operational in January 1977, its main research efforts in Syria have been centered on problems of cereal, legume and forage production and on the development of an integrated farm system research program in semi-arid areas. Since ICARDA has responsibilities that include 19 countries stretching from Morocco in North Africa to Pakistan in the Middle East, its research efforts must be concerned with its entire geographical responsibilities rather than just within Syria. Nonetheless, with its other centers in Lebanon and Iran delayed, ICARDA has focused its activities on an extensive building program near Aleppo. The research area and housing facilities being constructed at Tel Hadia will be comparable to almost any research center in the world. There were in 1978 over 180 staff members in ICARDA.

The cereal improvement program to assist national research institutions in increasing wheat and barley production with new varieties and better management practices is well underway. In the region that extends from Morocco to Pakistan, evaporation exceeds precipitation from 4 to 9 months of the year with very erratic rainfall. The climatic zones within Syria give almost that great a fluctuation. Cereal production under such conditions is of critical importance in the region.

In its present stage, the ICARDA program in Syria still seems to be operating largely independently of any other national or international organization. There is little or no cooperative long-range planning for development of research studies with such organizations. In its cooperative efforts involving the MAAR, some experiments have been carried out. Such experiments, as observed in my field trips, fell in two general categories: (1) ICARDA ships seed to the experiment station with directions on how to plant it, care for it and harvest it, and the station sends the yield back to ICARDA (example: chick-peas at Homs); or (2) ICARDA brings their equipment to the station and plants, fertilizes the

wheat or barley and then returns to harvest the crop (example: wheat at Izrau and Kamishli). ICARDA also has developed a program of on-farm trials and demonstrations which may have made an impact in various localities. However, in the future ICARDA will attempt to involve more input from local and national agricultural officials in the design and use of such trials in order to disseminate the results of the trials as well as the techniques used in constructing the trial (see Manzardo's report).

However, the isolation from local agricultural agencies is always a threat. The integrated farm system program with its many facets is difficult to evaluate. Time will have to be the test of its effectiveness.

#### 4.5 Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD)

Since 1971 this regional center, whose headquarters are in Damascus (Douma), has been engaged in scientific and applied studies for arid areas in relation to: water resources and utilization, soil classification and fertility, soil water relationships and conservation, sheep pastures and range management. Presently ACSAD has more than 40 experts in different fields of specialization and has developed library and laboratory facilities. In addition to its research activities, the center trains specialists and technical personnel for the protection and utilization of natural resources and the environment throughout the Arab world. Exchange of information and cooperation with other institutions are an important part of the center's function. These responsibilities include 14 Middle East countries. Experiments are being conducted in Syria at Izrau (wheat); Sweida and Izrau (fruit trees); Deir-ez-zor, Lattakia, Izrau (soil-water); and at Hama and Salamieh (sheep breeding and animal production).

The wheat studies being carried on at Izrau were observed and seem to be doing well. However, even though the experiments are on a Ministry of Agriculture Research Station and the Ministry's offices face those of ACSAD, cooperation and planning in carrying out the experiments could be improved. Most field operations required by these sites were conducted by MAAR station personnel.

The cooperation between ACSAD and the Soils Directorate (Douma) in the Syrian soil survey project seems most commendable. A pattern of real cooperation has developed that other agencies could use as a guide. Unfortunately, the financial resources for ACSAD are very limited and good research projects go unfunded. The center's focus on problems of arid areas certainly deserves support and encouragement.

#### 4.6 Other Agencies Conducting Agricultural Research

Time did not permit us to visit three institutions which are important, or potentially so, for agricultural research.

4.6.1 Tobacco Institute and its Research Facilities in Lattakia: This organization, which is administratively under the Ministry of

Foreign Trade conducts significant research on (1) the selection of the best varieties of tobacco to be introduced in terms of their productivity and adaptability to processing; and (2) the appropriate ways of planting, producing, maturing, harvesting, processing and fertilizing tobacco under the soil and climatic conditions in the Tartous and Lattakia areas.

A certain amount of success has been achieved in getting the Institute's research results into the hands of producers through the use of special production contracts and close supervision (see Manzardo's report on the Agricultural Information System).

4.6.2 Livestock Experimental Stations of the MAAR: Details concerning the livestock and range management programs presently underway in Syria can be found in the Assessment Reports by Boykin and Khoury and by Manzardo, and in the proposed curriculum development program being proposed by the University of Damascus. Probably the most significant livestock research has dealt with Awassi sheep breeding and selection initiated through an agreement between the MAAR and the Arab Center for the Studies of Arid Zones and Drylands, especially in the Hama Sheep Breeding Research Station. It should be noted, however, that in terms of national resources, most have been channeled to plant related research and little to livestock.

4.6.3 The Arab League Forestry and Range Management Institute in Lattakia: This Institute is oriented primarily toward educational activities and training in forestry and range management techniques, but the opportunity for research exists and should be developed.

4.6.4 FAO: FAO conducts a number of projects in Syria which mingle research and action programs. The Integrated Development projects, located near Tartous and Hasakeh, are experimenting with the development and dissemination of new production techniques. Perhaps the most interesting experiment has involved the creation of "Heme" cooperatives in the steppe in order to help the Bedouin reestablish range management and control and stop the deterioration of the steppe which has become an extremely serious problem in recent years.

## 5. Cooperation and Coordination among Research Agencies in Syria

Since this assessment found the bulk of present agricultural research being conducted within the MAAR, at least among the Syrian agencies, the following comments pertain to the cooperation between the MAAR and the other agencies operating in the SAR.

Cooperation of the MAAR with international centers is primarily limited to ICARDA. This cooperation usually takes on either of two forms, with: (1) ICARDA providing varieties of seeds (i.e., chickpeas) to be planted and harvested by the experiment station personnel, presenting the results to ICARDA; or (2) ICARDA personnel and equipment coming to the station and planting the experiment (usually



wheat), then returning to harvest and provide the results to the experiment station.

CIMMYT provides corn seed and CID potato stocks for several agricultural experiment stations.

Cooperation with ACSAD is still limited. The MAAR assigns certain land areas to ACSAD whose technicians conduct experiments many times in isolation from national agencies. There seems to be good cooperation between ACSAD and the Directorate of Soils, Douma, however, in the project to map soils in Syria on a 1:250,000 scale. ACSAD is also heavily involved in range-oriented research work, such as work in determining fodder intercroppings patterns, assessing the use of certain shrubs in range improvement and improving the milk, meat and wool characteristics of the Awassi sheep. These activities involve cooperation with personnel from the agencies of the MAAR involved in animal husbandry and the use of land on the Al-Kirim and Wadi al-Azib stations near Salamieh and Essyrieh, respectively (cf. Manzardo 1979).

FAO involvement has declined recently but three specialists were encountered working on, respectively, wheat, citrus and plant protection. They seemed to be very effective in their cooperative efforts. Living in the community and being a part of the experiment station "staff" seemed to greatly increase their effectiveness. In addition, FAO and the WFP especially are playing a big role in experimentation involving reclamation of the steppe.

Assessment of the research cooperation within the Ministry itself, however, proved more difficult. Of particular concern was the detected absence of cooperative research in field experiments (with dependent variables such as plant population-variety-fertility interactions) between the Soils Directorate and the Department of Research. Obviously February and March are not the best times for viewing field studies, but only one field diagram of corn variety-fertility study and the ICARDA nitrogen study of wheat gave evidence of research involving such interactions. Also, although the type of soil dictates much of the research work possible to conduct, detailed soils maps were available only for the Euphrates River area. The lack of cooperation between the Soils Directorate and the Department of Research is serious.

The Agricultural Research Council has been reestablished and although no meetings have taken place to date, activity is soon contemplated. It is presently chaired by the Minister of Agriculture with committee members from the various ministries dealing with agriculture, the three Deans of the Faculties of Agriculture, and a representative from FAO, ICARDA and ACSAD.

## 6. General Recommendations and Observations

The dissemination of results of agricultural research will be discussed in detail by another member of this team, but observations



made during the visits to the agricultural experiment stations and to the agricultural centers indicated only a minimum of information exchange with farmers. The training facilities at the agricultural stations were very limited and only field demonstrations could be really used for either teaching or training. Only a couple of leaflets were found that could be used to bring the information to the growers. Even annual reports were hard to find in any language. A wheat demonstration on the east side of the Damascus-Ammon Highway, just north of Dar'a, was the only extension demonstration observed by the author, although the time during which the tour was, as we have said, was not favorable for seeing demonstrations in progress.

The experimental stations are conducting research under some rather difficult conditions. In general, the facilities are extremely limiting. A building program underway at two stations with plans at another indicates a desirable trend. However, all stations need transportation. This was usually expressed as a need for two vehicles: a four-wheel drive field vehicle, and a mini-bus. The need for such vehicles to help move personnel in conducting the research is obvious. Such support would make a daily input to their operation and be most appreciated and helpful.

Most agricultural experimental stations are in need of new field equipment. Although they usually have one large heavy-duty tractor (50 h.p. or larger) that is fairly new, the small tractors needed to conduct field experiments are at least 15 years old and need replacement. Tillage, planting and harvesting equipment necessary for plot work is also needed. This equipment should be simple and able to be worked in small plot areas. The purchase of this equipment should be considered of high priority for each station.

In order to strengthen the research program of the Research Directorate, the visits to the agricultural experimental stations were used to also identify the most promising sites for the major development of research stations. Since only a limited number of sites could be selected, those that would contribute the greatest benefit to the Syrian developmental goals are considered of highest priority. Those identified were selected also on the grounds of having (1) a sufficient area for installing adequate facilities and experimental plots, and (2) a location favorable to their becoming regional experimental stations, so that research data would have regional and/or national applications as one works toward national goals.

The role of agricultural research will become increasingly important in the future, especially in the most promising agricultural areas in Syria. Two of these most promising regions are:

The Euphrates Project: Rising in northeastern Turkey, the Euphrates River enters Syrian territory in the northeast and flows some 450 km. into Iraq. Much of the project area falls within the 100-200 mm. annual rainfall. It consists of natural grazing lands

and dry-farming lands; low-yielding barley is a main crop and sheep rearing is the main animal husbandry activity. The low productivity of the land was reflected in an overall gross yearly production which averages only LS 60 per ha.\* Irrigated agriculture is practiced in the Euphrates Valley, and over the years agriculture has always been of central economic importance. The intensive irrigation practices have given this limited area an average gross annual production of LS 1,000 per ha. The main irrigated crop is cotton; cereals, fruits and vegetables are secondary crops.

The multipurpose nature of the Euphrates Project has several objectives, but the main one is the irrigation of at least 600,000 ha. of land (i.e., doubling the present irrigated area and trebling the amount of water already being utilized). Since the Euphrates flows through several Mohafazat and the opening of new lands along its banks will affect an entire region, it is recommended that a regional agricultural research complex be created involving the MAAR, GADEB, the Cotton Bureau, the Seed Multiplication Bureau and the Faculties of Agriculture at Aleppo and Deir-ez-zor. The development of such a regional agricultural experiment station could begin with the upgrading of the present station at Rakka in coordination with GADEB. Detailed descriptions of the Rakka and GADEB stations have been provided earlier in this report. Substantial land is available in different soil and water environments and an opportunity exists for the creation of buildings and laboratories to complement those already in place.

The Ghab Project: The Ghab Project is located in the west-central part of the country along the Orontes River along a valley 60 to 70 km. long and 10-15 km. wide. The total area of the region is 75,000 ha. The Ghab Valley is favorably located for development purposes. It incorporates parts of the Mohafazat of Aleppo, Idleb, Lattakia and Hama. The proximity of the ports of Lattakia and Tartous encourage production for export.

Prior to 1949, about 35,000 ha. of the Ghab plain were swampy and malaria infested. The major obstacle to the development of the area was the swamps fed by the slow outflow of water in the Ghab plain and the lack of drainage because of the accumulation of silt in the Orontes riverbed. To control the flow of the Orontes River, the basaltic silt at Kfeir was excavated so as to widen and deepen the riverbed and two dams were built near Halfaya and Rostane for the control of the Orontes floods and for irrigation purposes. A road network has been constructed and the drainage and irrigation networks are well underway. The irrigation and land reclamation are making possible an extension in the cultivation of cotton, cereals and vegetables. Cotton is primarily an export product. The deep alluvial soils of the Ghab Valley make this area potentially very productive if water management practices are combined with

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\*S. Pitcher, Syria's Euphrates Dam Promises Rapid Agricultural Development, U.S. Foreign Agriculture, Dec. 23, 1974.

improved agricultural techniques. As a first step, the Ghab agricultural experiment station should be improved and linkages created with the Faculties of Agriculture at Aleppo and Lattakia. Then other stations in the area could be incorporated to create a regional research unit incorporating the Ghab as well as the steppe areas which extend to the east and the coastal zones to the west.

In addition to the Rakka and Ghab stations, the stations of Jellin, Homs and Himo are strategically located and have a land and infrastructure base which should allow them to be developed as regional research centers. Jellin represents the conditions in southern Syria; Homs, that of the central zone and the steppe; and Himo, the agro-climatic zone of the northeast. Although further study is necessary, the preliminary recommendation is for the creation of five regional research centers at:

(1) Rakka; (2) Ghab; (3) Jellin; (4) Homs; (5) Himo.

By linking the research at the stations within these five regions to the production planning for the regions as a whole, it is felt that both the quality of research and the quantity of production can be improved. These linkages should be both administrative and scientific.

There are other stations that are very promising such as Jableh and Aleppo and their input into Syrian agriculture in the near future will be very important. Aleppo is a special case; when a graduate program is developed at the University of Aleppo, College of Agriculture, the need for expanding the research will increase greatly. Then the need for one station to carry on cooperative research between the university and the MAAR, rather than the present split arrangement at four locations, should be corrected. It should be noted that satisfactory field research cannot be carried on from a distance of 15 to 30 km. without a large supporting staff on the stations.

To develop the overall research strategy for agriculture in Syria it is necessary that the Agricultural Research Council resume an active role and that its composition be carefully considered. It is desirable that the Minister of Agriculture (or his representative) serve as chairman and committee members be selected from the various Ministries dealing with agriculture. Members should also include the three Deans of the Faculties of Agriculture, the Director of the Research Directorate of the Ministry of Agriculture, the Director of the Soils Directorate, Ministry of Agriculture, and a representative from FAO, ACSAD, and ICARDA. Meetings should be scheduled well in advance on a semi-annual basis at least regardless of other claims on the time of committee members. The Agricultural Research Council seems to be the one unit that should have the responsibility and the authority to develop and implement the research strategy for Syrian agriculture. Given the problems of creating and managing a national research program, however, perhaps initial steps could be taken to construct regional management



councils where participation of farmers as well as governmental agencies could set priorities and guide research toward productive projects.

Relations between the Ministry of Agriculture and the Colleges of Agriculture are very limited. Only one joint research experiment was observed on this level and this seemed due to the friendship between the individuals at the College and the Ministry of Agriculture Research Department, rather than any planned linkage. Students, however, do visit certain stations for study and several have a class for a week or longer during the summer.

Salary differences seem to be one of the main obstacles to full cooperation between the College and Ministry. The 200 percent salary increase at the universities several years ago predictably created some ill will. Some correction should be made if meaningful cooperation is going to be generated in research studies. A pay-scale according to qualifications, rather than Ministry affiliation, seems desirable. Thus a Ph.D. in the Ministry should receive the same (or nearly the same) pay as a Ph.D. in the university. The wide difference in salary makes one professional seem to be a second class citizen, and reluctant to do truly cooperative research. Length of service is the only basis for salary increases obtained by professionals on the experiment stations. This reduces individual incentives and creativity necessary for good research programs.

This report has not attempted to define lines of research or to judge the quality of research being conducted. Substantial more investigative time and information would have to be generated to adequately explore these two questions. However, it is noteworthy that such evaluations are not presently conducted by any Syrian agency. The proposed Agricultural Research Council should take on these functions in order to properly manage the research program of the country.

The definition of the lines of future research which emerged from the 1977 Symposium seemed to be, in general, adequate. However, it should be noted that the call for socioeconomic research contained in that Symposium's recommendations is new and not to be found in other documents which set agricultural research policies. Such research into the economic and social feasibility of crops by region, the methods for efficiently using mechanized technology, the restrictions on productivity imposed by small-scale farming, the administrative and social problems of cooperatives, and the problems involved in migration are among the most critical for planning and carrying out future agricultural development in Syria. Such socioeconomic research can be a useful complement to agronomic research and can help planners and administrators as well as farmers better manage their respective enterprises. Of particular importance is the adapting of technology in agriculture not just to climatic conditions in Syria, but also to economic ones, in particular the prevalence of small-scale farm holdings.



Almost all experimental stations reported difficulty in hiring part-time labor during the rush season. This is predictable since the Ministry can only pay one-half to one-third of the going salary in the private sector. This employment problem may seem to be a small item, but in fact having competent, motivated workers is critical for conducting field experiments that may fail if certain fieldwork is not done on time. Such items must be considered by the administration and be given a higher priority than is presently the case.

If the agricultural experimental station is not located near a city, housing facilities for the professional staff seem very desirable. Schools should be generally located nearby. These factors must be considered in any future site selection process and have been taken into account in the recommendation of four of the five locations mentioned above (Himo is the most lacking in housing and schooling).

Although most of the fieldwork depends upon moisture holding and supplying capacity of the soil, only the Euphrates area has had a completed soil survey. It is necessary to complete similar soil surveys on all experiment stations, if the results are going to be given proper interpretation. A detailed soil survey of the land area assigned to each experiment station and proper analyses of the information on irrigated as well as rainfed lands should be undertaken.

Conversations with the Deans of the Agriculture Colleges indicate it is extremely difficult for farm youths to attend the university. A respectable number of the professionals at various experiment stations (not including Douma), however, stated that they were from farm families and an even greater number claimed to have had farm experience. The greater access of farm youth to academic training and later their involvement in agricultural research should help guide research into useful paths and help in the dissemination of research results to farmers.

Relations between the Ministry of Agriculture and the international centers are minimal. Attempts to find truly cooperative research between the Ministry of Agriculture and either ACSAD or ICARDA were largely unsuccessful. The one exception seems to be in the area of soil classification where good cooperation between the Soils Directorate, Douma, and ACSAD on the completion of a 1:250,000 scale soils map of Syria is progressing well. At the agricultural experiment stations visited, the international centers were using land to conduct their experiments as they saw fit, with little or no input from the Agricultural Research Department and the experiment station.

Both international centers are carrying on research in Syria, but since they feel a responsibility to 12-15 countries in the Middle East, neither can give Syria top priority. Their own specialists are used to develop research studies that will be of value to the larger region as a whole (not just Syria) although they are

conducted in the experiment stations in Syria. The technical expertise assembled at these centers should be more utilized by Syrian researchers. Specialists of the Ministry of Agriculture should invite specialists in the international centers to collaborate on research projects and vice versa. Daily working arrangements should be encouraged at the specialist level and not just at the top administrative level.

Relations with FAO personnel seemed to be good. The FAO specialists were working at the MAAR stations as a part of the research team and seemed to have a real input in the planning and execution of research. Being officed on the station made everyday discussion of research easier, and the understanding that has developed between the station staff and the FAO specialist seemed excellent. As might be expected, living and working in the same area seemed to be important. The three-year assignment also seemed to play an important part. These assignments may be extended, and thus a good working relationship develops over the longer time span.

Many of the staff at the agricultural experiment stations expressed a desire to obtain additional training or schooling. This idea seems an excellent way to upgrade the quality of the research being conducted and perhaps help overcome the salary differential. It seems desirable that all who can qualify be supported in this effort. This would include not only graduate studies for the M.S. and Ph.D., but postdoctorate studies as well for the younger staff members. The language requirement would not be as difficult for postdoctorate as for graduate students. A 6-12 month postdoctorate period would give the younger Ph.D.s in the Ministry a chance to become acquainted with the research programs in other countries and the techniques used. Foreign languages will be difficult for some of the graduate students and a special effort should be made to provide an opportunity for these individuals to improve their language skills and thus pass the tests required for most graduate schools. Research that has a practical and/or immediate benefit to Syrian agriculture should be given priority in all graduate or postgraduate studies.

Many of those who qualify are older and thus have family obligations. If the experience in further studies or training is going to be attractive and productive, serious consideration must be given to including an allowance for the individual to bring his family with him. This will obviously cost more, but probably is the best investment of additional funds in the entire education program.

## 7. Summary of Conclusions and Recommendations

### 7.1

To develop and implement the overall research strategy for agriculture in Syria, the Agricultural Research Council must be functional and its composition carefully selected. It is recommended

that the Minister of Agriculture and Agrarian Reform (or his representative) serve as chairman; with committee members from the Peasant Union; each of the ministries dealing with agriculture; the three Deans of the Faculties of Agriculture; the Director of Research Directorate, Ministry of Agriculture; the Director of the Soils Directorate, Ministry of Agriculture; and a representative from FAO, ACSAD, and ICARDA.

## 7.2

Special effort should be made to ensure that cooperative research develops between university and Directorate of Research personnel as graduate programs increase at the universities. Salary differentials for people with equal training and experience must be narrowed if truly cooperative research is to be conducted. Salary increases for research conducted and published should be considered.

## 7.3

Socioeconomic research should be generated as a complement to the agronomic research and as an aid in planning the development of agriculture in an environment of small private holdings and large collective ones.

## 7.4

Most agricultural experiment stations are in dire need of additional transportation, which usually includes one four-wheel drive type unit and one mini-bus type. Most stations also need field equipment which usually includes one small tractor (under 30 h.p.) and one larger tractor (over 50 h.p.) plus soil tillage and planting equipment.

## 7.5

Agricultural experiment stations that are recommended for priority consideration for development as a first class experiment station to serve on a regional basis as identified on the following map are:

- (1) Rakka; (2) Ghab; (3) Jellin; (4) Homs; (5) Himo.

## 7.6

Detailed soil surveys must be completed on all agricultural experiment stations since extrapolation of the research to even limited areas must consider the soil type to be valid. A national soil survey is underway by the Directorate of Soils in cooperation with ACSAD and this should be encouraged.

## 7.7

Housing for professionals should be considered for most experimental stations that are removed from satisfactory housing or need frequent attention as during the growing season for irrigation and/or pesticide control.

7.8

All professionals who are interested and qualify for graduate training, and those interested in postdoctorate training should be provided such an opportunity. Allowances to take their families for this study period should also be provided.

7.9

Part-time laborers should be paid more nearly the private sector wages so that more reliable work can be carried on during the growing season and that workers may be willing to return for several seasons.

7.10

Cooperative research with the international centers--especially those headquartered in Syria--should be developed, and maintained. Practical research problems for the Syrian farmer should be given priority. Since the centers are located in Syria, such research should be a priority item even though the centers may have research responsibilities for many neighboring countries.



# Syria: Agricultural Sector Assessment

## Volume 5: Human Resources and Agricultural Institutions Annex

### CHAPTER X

#### AGRICULTURAL EXTENSION

By

Andrew E. Manzardo

#### TABLE OF CONTENTS

	<u>Page</u>
Preface	3
1. Introduction	6
2. The Place of the Farmer in the Agricultural Information System	7
3. The Agricultural Information System and the Agricultural Engineer	8
4. The Agricultural Information System and the Ministry of Agriculture and Agrarian Reform	14
The Extension Directorate	17
The Mohafaza-Level Extension Office	24
Extension and the Administrative Activities of the MAAR	25
Special Programs of the MAAR (Possible Models)	27
General Marketing Organizations	28
The Ghab	29
State Farms	33
5. The Ministry of the Euphrates Dam	35
6. The General Union of Peasants and Cooperatives	36
7. General Organization for Tobacco	45

(Continued)

8. The Agricultural Cooperative Bank	45
9. International Agencies	46
10. Summary and Recommendations	48
Notes	58
Bibliography	60
Appendices	62

A great dam may be a complete success from the engineer's standpoint, a complete failure because the land it is designed to irrigate has soils incapable of successful irrigation. Or, again, the dam may be successful, the irrigation successful, yet it fails to benefit the people either because the hydrologist and the doctor have not worked together in control of disease, or, more likely, the sociologist's knowledge of organization of the people has not been used or understood. Every development project must be based on full detailed, cooperative and integral surveys: every aspect of the problem must be studied. It is vital to make haste slowly if lasting benefits are to be achieved.

L. Dudley Stamp  
A History of Land Use in Arid Regions

...The character of the agricultural laborer should be treated as something absolute, like the climate and soil, and that, therefore, all the conclusions of the science of agriculture should be deduced not from the data of soil and climate only, but from the data of soil, climate and the given character of the laborer...

Count Leo Tolstoy  
Anna Karenina

Preface: A Methodological Note on the Assessment of  
Agricultural Information Flow in the Syrian  
Arab Republic

The overall objective of the Agricultural Sector Assessment is to assemble a reliable and broad data base on the development of Syrian agriculture for use in the preparation of the fifth Five Year Plan (1981-1985). The present study describes the present state of the agricultural information system; that is, the system which has served to channel the communication of technical information concerning agriculture within the SAR.

The Agricultural Information System

Although this assessment stresses agricultural information that can be "extended" or communicated as part of rural development programs, information about nutrition, health and sanitation, family planning and literacy could also all be part of a comprehensive rural development scheme. These other elements should be considered in the design of a communications program for rural development in order to maximize any one program's impact on complex situations as well as to coordinate efforts efficiently.

Before moving to a description of the ways communications flow within the Syrian agricultural system, there are certain assumptions about the communication process which are implicit within the analysis which follows. In order to allow the reader to understand the basis of certain recommendations, these assumptions should be made explicit as follows:

1. Communications, in Part, Creates a Climate for Development.  
This is to say, when information is accumulated in certain limited sectors of the population, the development process as a whole is hindered or uneven. It is only when technical data, especially agricultural information, reaches those who can utilize it that development can occur at a maximum rate.

2. Two-Way Communication is Superior to One-Way Communication.  
The principal of feedback must be an integral part of any interaction between technicians and farmers in order that the effects of either's activities can be monitored and modified if necessary to improve effectiveness of both participants in the process of communication. The design of programs in agricultural improvement should take into consideration data on local environment and local practices to assure that national programs fit local needs. This modification carries with it the task of broadening the base of decision-making to include those who work the land.

3. Parallel Channels Improve the Chances of a Message Getting Through. In essence, this principle means that no single organization should be totally relied on for the purpose of structuring exchanges of information among farmers and governmental communicators such as extension agents. Repetition of a message through several channels and several sets of organizations is the best guarantee for success. A multiplicity of extension organizations is thus preferable to a single system. This multiplicity of channels increases the difficulties of coordination among the various organizations which channel messages.

4. Demonstration is the Most Effective Form of Communication. Extension agents who can and actually do perform the tasks they wish to teach will be the most successful communicators of agricultural information.

5. The Message Must Fit the Culture one Desires to Change. Quite simply stated, the message must be both available and understandable to those who are meant to receive it. Farmers have to learn the technical language of modern agriculture and extension agents have to fit their messages into the culture of the communities they serve.

6. Finally, The Message Must be Received by the Person for Whom it was Intended, the Person Whose Decision will Effect the Change. This principle concerns the ability of organizations to get their communicators "close" to the target audience. An extension service is effective to the extent that it gets its agents into the field to talk with farmers, distribute their pamphlets, show their movies, etc. Failure to do this renders ineffective all care taken at earlier levels and thus negates the entire communication process.

All of these elements are not recommendations, they are assumptions, part of an approach to communicating ideas in agriculture which will provide the basis for assessing alternatives for action within agricultural extension. It is evident that no system has been established in any country which simultaneously maximizes all these elements, but the statement of principle at the outset provides a ruler against which actual alternatives can be measured.

#### Approach Used in the Study of the Flow of Agricultural Information

This report describes the organizations which provide information within rural communities. It attempts to describe the relationships between farmers and national institutions. In order to get some insight into these interactions and exchanges, I went to the villages themselves wherever possible to look for evidence of government activity in the agricultural informational sphere. In addition, I looked for other sources of agricultural information as well. Any information which concerns new techniques for growing crops or new types of crops themselves was treated as "agricultural information" and traced to its source. In each case, however, I have



to study communication from the farmers' points of view, that is, to find the communicating institution in the village and trace its links to the government rather than the other way around, but this has not always been possible.

The exclusive use of this kind of methodology can produce an "inferential" assessment of the workings of the technical information system. Simply stated, only those organizations whose work could be identified in the villages I visited (Map 1 shows the approximate route of travel) are treated here. The shortage of data due to a lack of a village level survey at the time the report was written prevented the conclusion of this assessment from being able to be extended into village areas not visited. Such an approach may produce a report which appears lopsided or incomplete, in some cases stressing organizations which seem irrelevant to the point of view of the government, while other programs are ignored. If such a bias exists in this report, I hope that the damage is not irreparable.

It may be the case that some organizations and their programs were present in the field but were missed, due either to the limited nature of the study or the period of the year (February-March, 1979) when it was done. Although I admit this possibility and apologize at the outset to anyone whose programs I might have missed, I think that few field programs are not present in this report. Instead, the greater danger is that certain programs have been overemphasized. More time in the field might have provided a better balance.

What balance there is in this report is due to the time taken by farmers and public employees to answer my many questions. The patience and knowledge of Mr. Hisham Kayali, who accompanied me on many visits to offices and sat with me in many hot fields has contributed largely to any accuracy this report may have.

## 1. Introduction

The IDRB report entitled The Economic Development of Syria, written in 1955, reported on the condition of agricultural extension at that time and characterized the problem as follows,

In most underdeveloped countries, programs to improve agricultural practices founder because there is no organization and staff to work continuously with farmers, educating and assisting them and demonstrating to them the practical utility of better methods and techniques. In Syria, too, there exists no agricultural extension or educational service in that sense. To be sure, the various departments of the Ministry of Agriculture have representatives in the Mohafazat or provinces dealing with such subjects as agricultural production, veterinary matters, plant protection and the like. But the time of these men is largely monopolized by various administrative tasks such as the enforcement of government regulations, crop reporting, locust control and similar matters. They do not have the opportunity, and sometimes not even the inclination, to work with individual farmers. Their contacts with villages are brief, sporadic and infrequent (95).

It is the purpose of this report, nearly twenty-five years later, to assess programs to improve the agricultural practices at the village level in the Syrian Arab Republic, and to ascertain the nature of the communication which exists between farmers and the governmental agencies concerned with farmer activities and well-being. This report is therefore concerned primarily with the current state of the agricultural information system within the Syrian Arab Republic, particularly with reference to its direct effects on rural life.

The term "agricultural information" is meant to be a more neutral term than "extension." It not only refers to the education of farmers to better methods and techniques, but also to the data which are the product of governmental technicians monitoring the needs and priorities of local communities. It refers to agricultural techniques, farmer knowledge about those techniques, data about the local environment, both physical and biological, and to the effects of human action upon those features.

The term "system" implies that local actions and governmental actions are interrelated, and that the degree of interrelationship somehow affects the quality of the programs enacted. It also implies that the interrelationships between the various organizational elements within a system are continuous. Changes in any one element can, therefore, effect changes throughout the system. By maximizing our information about each element within the system and the relations between them, we can best predict the effects of changes at any given point.

Although this model does consider formal organizations, it places stress on the actual delivery of services as determined through field observation. Since the analysis is concerned primarily with system, implying a complex series of interrelationships, it is impossible to find an "objective point" from which to begin. Instead, one must arbitrarily select a reference point and work from there. Our reference point will be the local community, and we will be concerned with the delivery of services to the village and with the ability of organizations within the system to recognize the needs and concerns of farmers and pass them on to the agencies charged with delivering solutions. We are, therefore, concerned with the flow of information throughout the system and not merely with a uni-directional "delivery" to farmers.

## 2. The Place of the Farmer in The Agricultural Information System

Since the farmer is the primary target of most agricultural programs, some observers argue that the goal of the agricultural information system should be to change farmers' behavior in certain valued directions. This view misses the point. The farmer is not a target of the system, but is an integral part of it. To miss the potential value of his input into the system is to condemn efforts toward improving agriculture to dismal failure.

Although this observation may seem self-evident, many government officials at times take an extremely paternalistic attitude toward farmers and see information as having an essentially one-way flow. This "banking" style of communication means that once the technician, who has the technical capital (information), deposits this capital in the head of the farmer, his job is successfully finished. Communications research has shown, however, that only through exchange can a technician and farmer profitably interact.

The "banking" mentality of agricultural extensionists is well entrenched in most countries. This outlook is seldom threatened since little social science research has been undertaken in agricultural communities in Syria in recent years; thus there is no evidence that the "banking" style doesn't work. Aside from the studies of Sweet (1960) and Horton (1961)--now themselves quite dated--and the shorter analyses of Hinnebush (1976) and Gattinara (1973), there have been no systematic and wide-ranging studies of agricultural communities in this country since the time of the French.

Because of the deficiencies in this area, we have little information about how farmers make decisions or even about their basic farming systems. Little is known about relations between peasants and landlords, pump owners and landowners, Bedouin and sedentary populations, and small owners and cooperatives. Many inventories



of physical resources have been done in Syria, but their linkages to program planning of extension have been minimal. Little systematic information exists, therefore, to inform agricultural planners of village realities which differ so much across the country and which should enlighten technical agencies about the means for best exchanging agricultural information with farmers. A variety of efforts for communicating with this unknown audience exist, however, as will be described in the following pages.

### 3. The Agricultural Information System And The Agricultural Engineer

The unifying element throughout the agricultural information system of the SAR is the agricultural engineer, or the muhandes ziraai. This term refers specifically to the holder of a B.S. degree in agriculture, generally from one of the Syrian universities.

According to Bakour (N.D.), 71 percent of the agricultural engineers registered in the Agricultural Engineering Syndicate in 1976 worked for State organizations. Of 3101 agricultural engineers registered in 1977 (see Table 1), 29.5 percent worked specifically for the Ministry of Agriculture and Agrarian Reform (MAAR), while the rest worked for other organizations concerned with agriculture (see Table 2 for a breakdown of State organizations hiring engineers).

The 29 percent which remain have been hired by the private sector or by international and regional organizations. According to Bakour, some of these engineers are employed outside of the SAR, while others have been offered jobs abroad, but have not received permission to leave their present positions. A certain number of B.S. holders are either not registered or are registered and work as private farmers or in other professions. There are no estimates of their numbers.

The multiplicity of roles played by these agricultural engineers is in sharp contrast to the similarity in their training. This homogeneous training (see the discussion of university curriculum in the Faculties of Agriculture in Shannon, 1979) leads to a similarity in outlook and purpose between those working at seemingly diverse occupations and at the same time it creates a series of informal linkages between offices which may appear to be organizationally distant when considering only government tables of organization.



TABLE 1: Agricultural Engineers Registered in Syndicates by Mohafaza, 1965-1977

Year	Total	Quneitra	Tartous	Dar'a	Sweida	Al-Rakka	Al-Hasakeh	Idleb	Dier-ez-zor	Lattakia	Hama	Homs	Aleppo	Damascus
1965	489	10	--	7	1	20	28	10	34	45	32	27	91	152
1966	---	--	--	--	--	--	--	--	--	--	--	--	--	--
1967	473	3	--	8	5	27	29	21	20	31	72	27	68	165
1968	707	4	8	13	7	20	33	45	6	57	81	43	178	190
1969	895	5	12	29	11	20	38	51	32	75	106	68	231	219
1970	1021	5	18	34	13	28	38	54	43	88	117	77	288	245
1971	1140	7	23	39	17	21	41	60	65	98	132	81	300	283
1972	1273	7	31	42	18	23	45	68	62	111	154	97	327	290
1973	1435	9	43	53	22	24	49	76	66	117	170	114	372	327
1974	1626	11	52	68	27	24	60	77	84	129	192	132	402	368
1975	1979	15	76	79	32	26	71	86	94	170	228	161	489	452
1976	1886	21	90	73	44	185	74	75	90	101	117	137	367	512
1977	3101	31	112	84	44	230	130	65	99	244	209	148	459	645

There were 601 engineers registered in various Mohafazat but not appointed until 1977.

Note: These figures include all agricultural engineers including those in the MAAR, Peasant Union and other government organizations, as well as those in private organizations, the armed forces and those who are unemployed. These figures therefore represent the entire potential labor pool through 1977.

Source: Statistical Abstract, 1978. Table 12/14, p. 622.

TABLE 2: Distribution of Agricultural Engineers According to Mohafaza and Department (1976)

Mohafaza	Directorate of AAR	Faculty of Agriculture	Intermediate Ag. Inst.	Secondary School	General Union of Peasant	Organizations (General) Grain, Poultry, Seed, Fodder, Cows, Fish	Tobacco Monopoly	Union of Food Industries	Cotton Board	Ag. Credit Bank	Direct. of Planning	Others-B	Euphrates Basin	State Farms	Total
Dama. City <sup>A</sup>															237
Damascus <sup>A</sup>															104
Aleppo	105	40	5	6	36	38	8	2	43	1	1	16	--	--	301
Al-Rakka	52	--	-	-	2	4	-	-	--	1	-	1	113	1	174
Deir-ez-zor	73	--	-	-	5	10	-	-	1	-	-	-	--	-	89
Al-Hasakeh	94	--	-	-	2	9	-	-	--	1	-	-	--	-	106
Homs	80	-	-	-	11	6	-	6	3	1	-	7	-	-	114
Tartous	54	-	-	-	11	23	2	4	-	-	-	1	-	-	75
Lattakia	93	28	2	-	3	10	23	2	-	-	1	1	-	-	167
Idleb	44	-	-	-	4	5 <sup>C</sup>	-	-	-	2	-	-	-	-	55
Hama	123	-	-	-	9	26	2	4	2	1	-	-	-	-	167
Dar'a	41	-	-	-	6	5	-	-	1	-	-	-	-	-	53
Sweida	36	-	-	-	1	4	-	1	-	-	-	-	-	-	42
Quneitra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5

Derived from Bakour, N.D.

- A. Breakdowns not available
- B. Includes General Organization of Peanuts, Directorate of Education and Central Corps of Inspection.
- C. Includes Cotton Board.

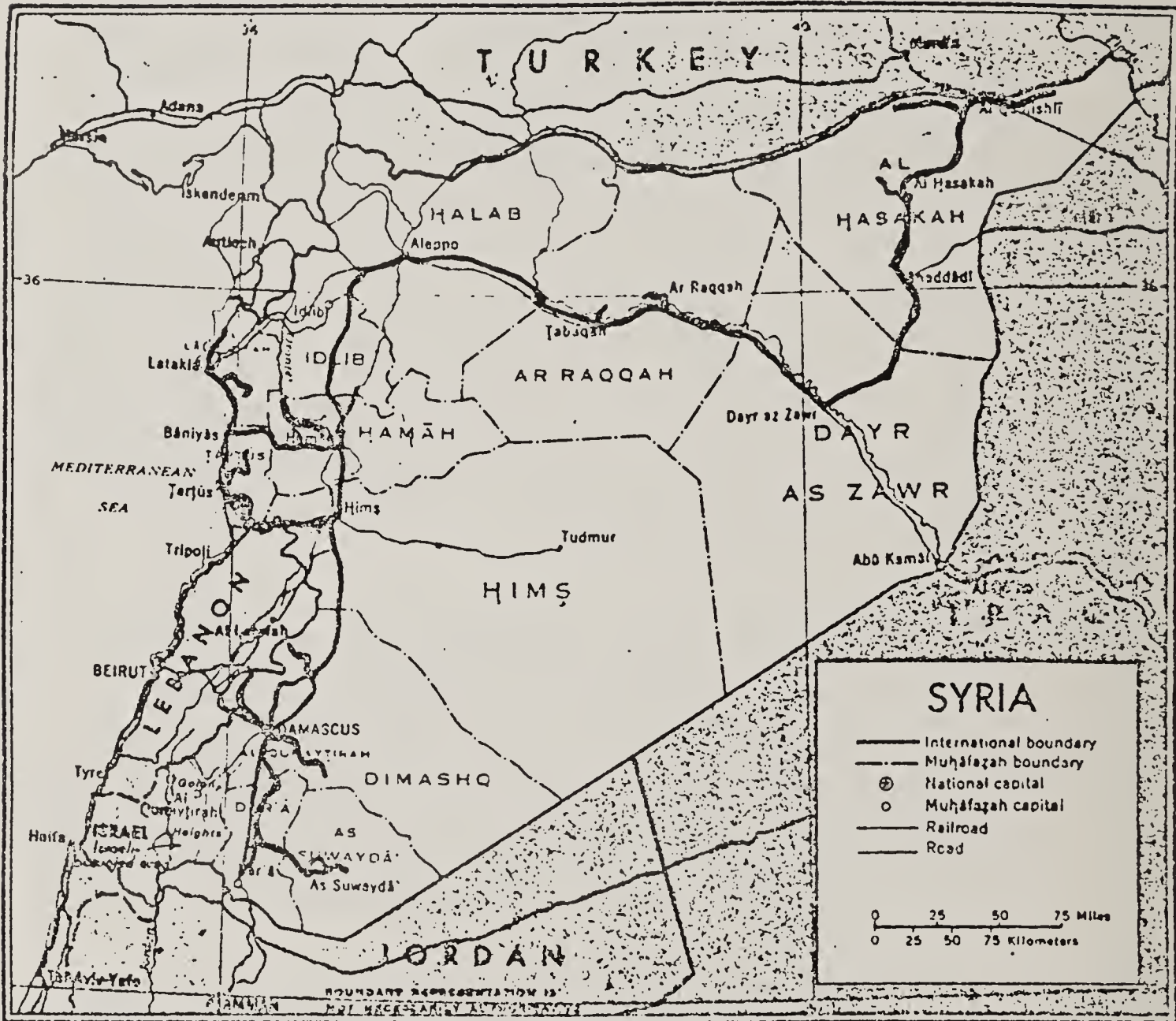
Although in recent years there has been relatively little formal agricultural extension done in the SAR, agricultural technical information is being disseminated through many of the organizations which hire agricultural engineers in the course of their involvement with farmers. This information is being transmitted directly by the engineers or members of their staffs, so a profile of these individuals will help us to establish the nature of some of the basic elements of the agricultural information system of Syria.

The average agricultural engineer appears to come from middle level farming or rural merchant families. However, despite the rural origins of many engineers and the importance of agriculture in the economy of Syria, agriculture is not generally a prospective university student's first choice for higher education<sup>2</sup>, thus the agriculture schools generally contain students whose grades on the college entrance examination were too low to gain them entry to other higher status career courses. At the same time, the agricultural option is not the lowest status career choice, but falls roughly in the middle of the exam's qualifying scores. Some engineers say that although they hoped to enter college in fields other than agriculture, they did become interested in their field as time went along. All complained that the university textbooks were inadequate and not specifically related to agricultural problems in the SAR, and that they were not given enough practical training in agriculture. Recent graduates complain of overcrowding of facilities, the result, perhaps, of attempts to increase the numbers of agricultural engineers in the field without an adequate expansion of educational facilities.

A graduate engineer is faced with a limited number of options. The best paying jobs are with organizations abroad, with international and regional organizations operating in the SAR, or in the private sector. These jobs go to engineers with greater experience, advanced education or family and personal connections; they are seldom options for the newly graduated engineer. Rather, the graduate generally goes to work for the MAAR, the Peasant Union, one of the general commodity organizations, or leaves agriculture entirely to enter another field. The government is legally obliged to hire all graduates of agricultural colleges who desire to work, thus encouraging most graduates to work in the agricultural sector at least part-time.

Agricultural engineers who work for the MAAR generally begin in their own Mohafaza<sup>3</sup>, according to the policy of the MAAR. If they rise in rank or transfer to a more specialized department, engineers will often be moved to another Mohafaza. This policy presents both advantages and disadvantages. It is a good policy in the sense that the engineer begins in the agricultural area of greatest familiarity, close to family, which can improve morale. At the

MAP 1. AREA COVERED BY SURVEY OF AGRICULTURAL INFORMATION



Base 502877 1-76



same time, however, there is a tendency for engineers to work with farmers from their own ethnic community. This means that farmers from other social groups in multi-ethnic areas are ignored because they are unfamiliar, and the engineer has no access to their group. This is not a problem in areas of great social homogeneity, but in other places engineers seldom leave their established patterns of social interaction. A further danger of this policy is that engineers increase local ties and thus often become unwilling to leave the home community to take on a more challenging job at a higher level as his experience increases. Stability, therefore, takes precedence over ambition in many cases,<sup>4</sup> particularly in the case of women who work as engineers.

There is also a similar pattern among lower level employees of the MAAR such as the agricultural assistants (musaed muhandes), the graduate of the Intermediate Institutes of Agriculture (2-year post-secondary schools), and the technicians (murakeb ziraai), graduates of the agricultural high schools. These types of employees are on separate tracks from each other and from the agricultural engineer. There is no way of rising from one level to the next. Moreover, even in the educational system there is limited mobility; only two or three graduates of the agricultural high schools can enter the university or intermediate institutes each year; the bulk of such graduates must enter the work force. Those who graduate from the intermediate institutes cannot enter the university, unless they leave Syria to do so. Completing the course of study at one of the lower levels does not mean that one can then enter training at a higher level. Thus, a technician or an assistant cannot progress upward to the next higher job through further study. Each job is on a different track. Regardless of how well any of these lower-level assistants perform, they are limited in their advancement in the State bureaucracies. This also means that an assistant or technician of great experience will make a considerably lower salary than a freshly graduated agricultural engineer. Such differences in status, pay and mobility cannot help but affect the morale of those in lower positions.

I have talked to several graduates of Syrian Agricultural Secondary Schools who are now agricultural engineers. All of them had to go either to Cairo or to Eastern Europe to get their advanced education, because there is no provision for these ambitious or talented individuals within the educational system of the SAR. Thus, they have to look outside for advancement which is costly to the individual and to the country since the SAR is taking a chance on losing their service to other groups outside.

Agricultural engineers also often feel their best opportunities for advancement lie outside the bureaucracy. The salary differential and opportunities for advancement are the primary reasons discussed for this, but the private companies and international agencies often provide the engineer with more challenging professional duties. Although the absolute numbers of engineers involved in the private

sector is not alarmingly great (29 percent), it should be remembered the selectivity of these organizations and the greater benefits offered probably indicate that many of the most dedicated and talented engineers, as well as assistants and technicians, are being wooed away from government service.

Low pay and lack of reward for good performance must also affect the quality of the work of those who remain in the government, as well as the frequency of their contact with farmers. Although there are some engineers who do their jobs and do them well, there are many who do little more than simply hang on. One is reminded of the statement made by the IBRD in 1955, that most "extension" matters have been in the hands of representatives of the MAAR who are not very effective since they have few opportunities and "sometimes not even the inclination" to visit with farmers.

To be fair, administrative duties do certainly cut into the time of the agricultural engineers, but many estimate these duties take up only 30 percent of their time. It is clear that increased attention must be paid to the needs of these key individuals--the agricultural engineer, the agricultural assistant and the agricultural technicians--if the quality of delivery of agricultural information is to improve.

Mr. Bakour (N.D.) has indicated that Syria needs a greater number of agricultural engineers. His feeling was echoed by those Mohafazat Agricultural Directors I was able to interview. Many of them stated that they had from 1/3 to 1/2 the number of engineers needed for effective programming.

The problem is not merely a question of numbers, however, for the engineers will continue to perform badly if they are inadequately trained and have poor morale. Improving the training and morale of those already in service will have, in the long run, a greater effect on the quality of information exchanges than simply and arbitrarily increasing the number of additional engineers trained in the current way and working under some version of the current system .

#### 4. The Agricultural Information System and The Ministry of Agriculture and Agrarian Reform

A prime mover of technical agricultural information in the SAR is the Ministry of Agriculture and Agrarian Reform, but its effectiveness as a communicator is limited by its own organizational structure. (See Ch. VIII for a discussion of the MAAR organizational structure and formal division of responsibilities.)

The vertical organization of the MAAR follows the division of the country into administrative entities of increasing size and complexity. There are, then, county or Nahia level offices, district or Mantika offices, and province or Mohafaza offices. These are in turn supported by the Ministry itself in Damascus. The term "supported" should be noted, because it will become apparent that each Mohafaza level appears to have a certain degree of autonomy from the Central Ministry, largely planning and controlling their own operations and those of lower-level offices within their command.

At the Ministerial level, there are special purpose Directorates for plant protection, animal husbandry, agricultural affairs and so on (see Figure 1 below). These act as an advisory cabinet for the Minister and each is overseen by one of three Deputy Ministers. Although these offices do a certain amount of programming and handle budgeting on a national level for many local-level programs, there is little direct communication between these offices and similar offices at lower government levels. In addition, these Ministerial Directorates often have to respond to programming ideas sent from the Mohafazat agricultural councils (made up of the Agricultural Director of each Mohafaza, head of the local party, the Head of the Confederation of Cooperatives, and so on), working them into the national plans. These programming "obligations" are passed to the Directors through the Minister's office. The importance of this pattern will become apparent.

Some ministry level Directors exert more control over local programming than others, but this is often less a product of an individual's skill than it is a question of whether or not that office's speciality is central to the local-level plan. Generally, offices whose concerns are somewhat peripheral to local interests have greater control of their programs throughout the system.

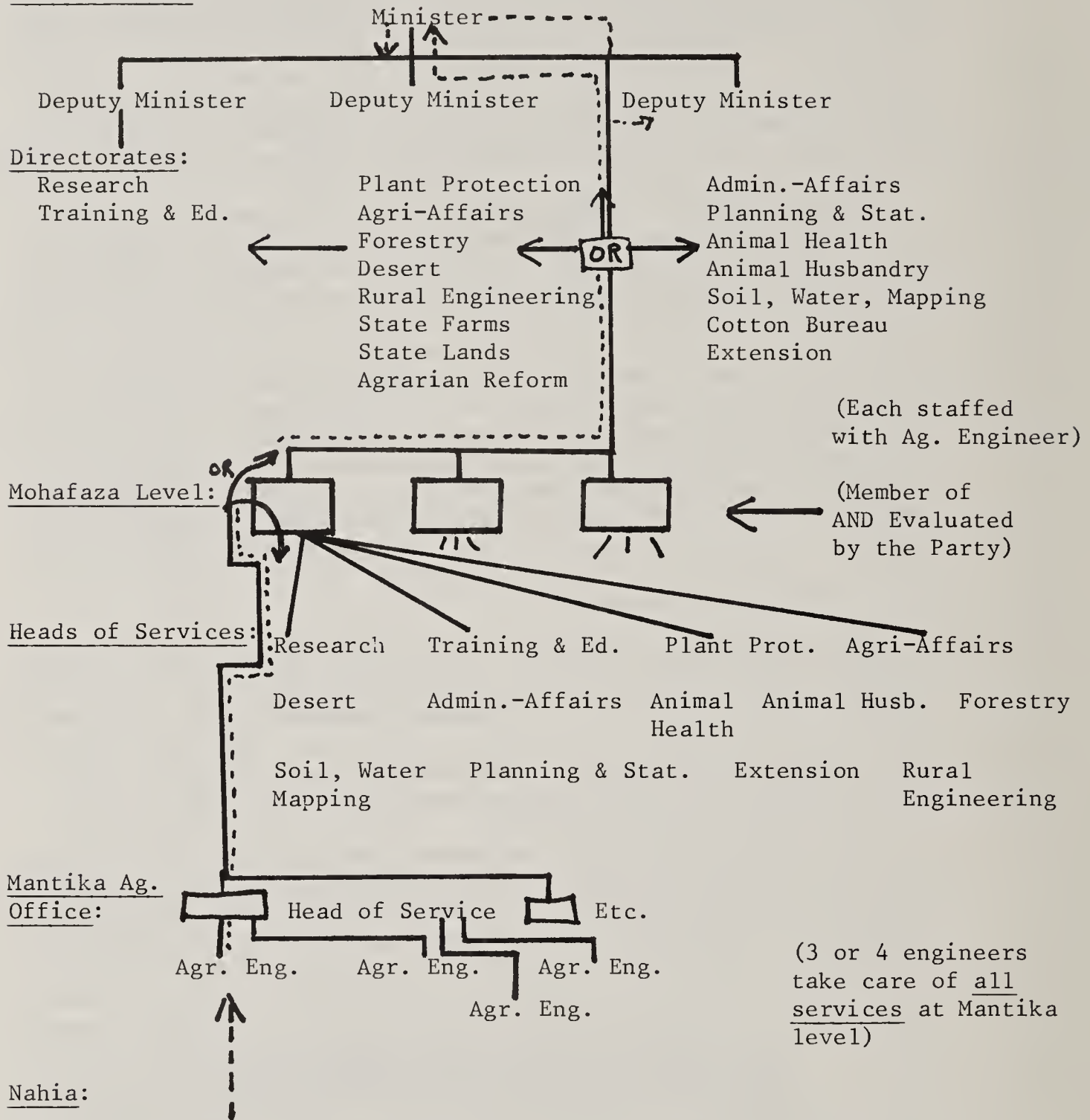
Each Mohafaza Agricultural Director exerts a great deal of control over provincial agricultural programming and thus over the type and amount of technical agricultural information distributed within a given area. Like the Minister, the Agricultural Director has a cabinet of specialists, called Service Heads, who represent the same special subject areas present in the Central Ministry (see Figure 1), with certain offices eliminated where geography demands (e.g., no desert office on the coastal plain, etc.). Each Head of Service has a staff of agricultural engineers as well as technicians and agricultural assistants, the mix determined largely by the local importance of the service and the availability of personnel.

Both the Minister and the Mohafazat Directors make programming decisions, and their decisions involve input from coordinating councils at the respective levels. These councils include other



FIGURE 1  
Ministry of Agriculture and Agrarian Reform (MAAR)

Central Level:



Path of Problem (----- )  
Path stops ideally at point where solution is found

Ag. engineers also in Coops, Ag. Bank, and Peasant's Union...  
responsible in part to MAAR

Each Ag. Eng. has same educational level (B.Sc.) although  
they differ in experience + length of service (ideally)  
at each level, some have been setn abroad for training.



executives at the appropriate level, as well as party officials, cooperative and Peasant Union officials. Thus, there are many inputs available in programming.

The Mantika office is simpler. Here the executive is a Head of Service supported by several agricultural engineers who take responsibility for more than one service area at one time. The work of these engineers is further supported by a limited number of assistants and technicians (as available). The Mantika-level Head of Service reports to the Mohafaza Director of Agriculture who is his supervisor.

Finally, the Nahia-level office is the lowest level of organization of the MAAR. Ideally, this office has a single agricultural engineer as supervisor and a staff of lower level technicians and assistants as available, and its workers spend a great amount of time in the field. One such office I visited (in Lattakia) seemed quite successful and well received. It is apparent, however, that there are an insufficient number of these offices at the present time.

Each level in the MAAR organizational structure is linked to the next higher level, primarily by executive-to-executive ties. Thus, the Nahia office is linked to Mantika office only through the office chiefs. Similarly, linkages between the Mantika and Mohafaza, and the Mohafaza and Central Ministry are largely effected through their respective heads. This means that although the specialized departments at the Mohafaza and Mantika levels do in large part replicate the specialized offices of the Central Ministry, there are very few, if any, direct linkages between these offices at various levels except through the executive linkages. This decentralized structure permits program adaptation to local conditions, but it also limits the communication flow within each program, including extension, as well as the continuity of communications throughout the MAAR. The proper balance between program flexibility and "efficiency" is a continuing dilemma, and the balance which is achieved will affect communication processes within the MAAR and with farmer communities.

#### 4.1 The Extension Directorate

The organizational structure of extension in Syria is being dramatically altered this year. The Directorate of Extension of the MAAR, created in December, 1978, is charged with,

working to achieve integration and systematic arrangements in the field of agricultural extension on all levels with government associations, institutions, and organizations concerned with agriculture and the improvement of production (Resolution No. 210/T, MAAR 27/12/1978. See Appendix for complete text).

At the time this assessment was made, however, there were few formal MAAR extension programs. Instead the Extension Directorate, which had just been transformed from an office in the Directorate of Agricultural Affairs, was in the process of restructuring itself to meet its new goals. The organization was studied, therefore, at a moment of transition. Figure 3 presents the model of the new organizational structure, and in Annex 4 I have presented a more detailed critique of the new extension program.

None of these offices or units are operational as of April, 1979. Some of the units, especially the "Association of Agricultural Extension" to be innovated in every Mohafaza, are not well defined. It is hoped that the fact that the institutional lines of the new Directorate have not yet solidified will permit some of the past lessons learned from the informal extension elements of the agricultural information systems to be applied to the structure and content of the formal one. The remainder of this report focuses on the system as it has been functioning in order to make more explicit these lessons, which are recognized by many engineers.

The present re-organization of extension follows various experiments with extension in Syria. Formal extension in Syria, according to Fort (N.D.) was introduced before World War II when extension agents from the American University in Beirut went to work in the Ghouta. After Syrian independence, the Ministry of Agriculture (formed in 1947) began courses in farm training in the Ghouta in 1948. By 1952 the Ministry had an Extension Section "confined to the information function" (ND:6); the section was further limited by the lack of personnel and unclear concepts of what extension or "guidance" (arshad) should be.

The 1958 union with Egypt brought a reorganization of the Ministry, and the Extension Service was made a full department. According to Fort, during 1960-61, 200 agriculture secondary school graduates were assigned as "extension agents" but none were assigned at the village level and few were assigned below the Mohafaza level (ND:9-10). It should be noted that the Rural Development Center system was started in this period. This idea will be discussed in section 4.4 below, and in Lemel (1979).

In 1962, the Ministry again reorganized. This time the extension service "tried to provide support in the field of extension to subject matter departments as each department attempted to carry on its own extension education work" (emphasis added). This experiment turned out to be an impractical solution because the manpower requirements for such a program were extremely difficult to satisfy (ND:13-14).

The period between 1958 and 1973 was significant for it saw the organization and operation of a major agricultural service in Syria. The organization of this service on the national level and on the Mohafaza level is shown in Figure 3 below.

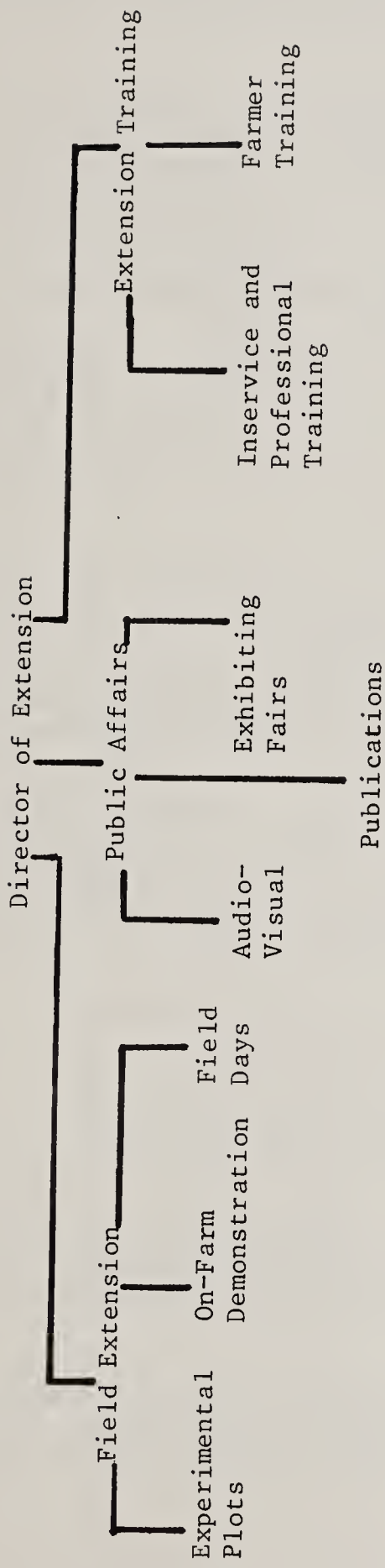


FIGURE 2: Present Structure of the Directorate of Extension - MAAR

The national ministry office appears to have laid stress on audio-visual techniques for extension (cf. Fort, ND:11), especially film and photos. Most significant, however, was the organization of the Governate (Mohafaza) level. Here for the first time one finds a true field level extension service.

According to El-Zoobi, there were during the early 1970s 50 Agriculture Extension Mobile Units. Each unit was supposed to include two agricultural college graduates, three secondary agricultural school graduates, and three laborer who, according to El-Zoobi,

worked with farmers side-by-side and face-to-face during production seasons (1971:161).

Although it is difficult to judge how close El-Zoobi's picture is to the actual system operating at the time, I was able to interview several members of the old extension units and found that they consist of one technician and only occasionally one agricultural year.

One of these engineers, now working for a different office, told me that the mobile unit personnel lived in trailers at the farm sites during the production season. His team at that time consisted of himself, an assistant and two technicians. Other teams were similarly constituted. Each team had a vehicle. Some teams were equipped with cinema projectors, sprayers, dusters, fertilizers and insecticides (1971:128).

The individuals I interviewed agreed with El-Zoobi in stressing that these programs were geared to the seasonality of certain very important crops. Cotton, sugar beets and tobacco production were "fully supervised by mobile extension units" (1971:161). This fact, however, may have led Fort to observe that in 1964:

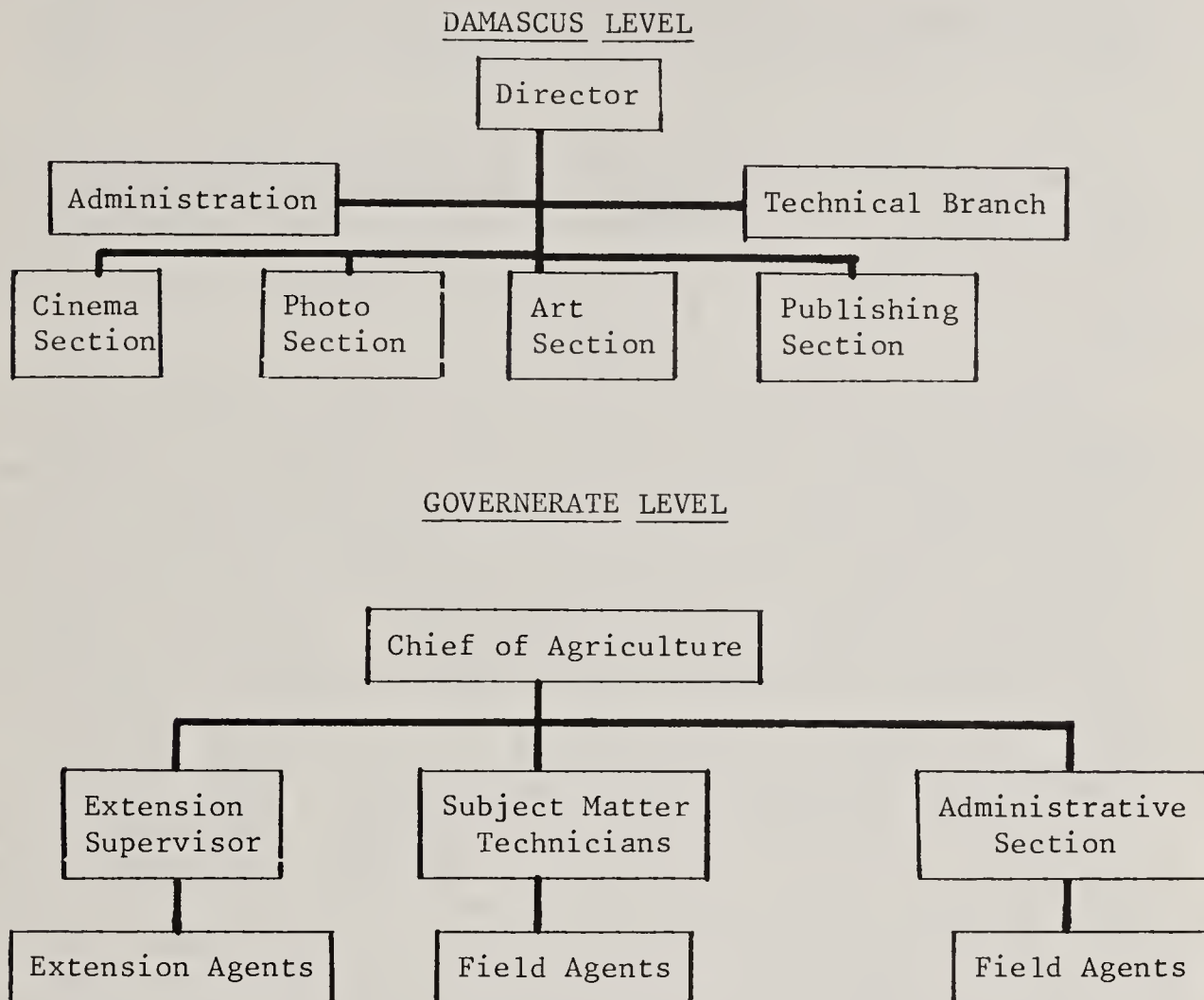
The service activities of the Ministry of Agriculture only strengthened the dependence of farmers and peasants to look to some higher authority to solve their problems. By carrying out service functions the Ministry prevents farmers and peasants from learning to perform the tasks themselves (ND:11).

Thus, although the government tried very hard to provide services and technical information transfer to farmers, their very zeal in "depositing" information may to some degree have prevented actual knowledge exchange from taking place.

All who were interviewed about this system, however, remembered it as being superior to any other system organized since. The reasons for this success which that program may have had are largely



FIGURE 3: The Organizational Structure for the Department of Extension in the Period 1958-1966



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Source: Raymond E. Fort, "Agricultural Extension in Syria," Report No. 1, Damascus : The Ford Foundation, January, 1963: p. 20, reproduced in El-Zoobi, A.M., 1961:160.

due to the high degree of contact between farmers and extension agents. Agents had received some additional training, but mostly only two weeks in-service training, but were involved in projects which included more than simple technical transfer. Agents were also highly motivated by being involved in innovative social experiments--such as the organization of the cooperatives between 1955 and 1958 and also after 1961 (El-Zoobi, 1971:117; see also Shuman, 1965:8-33).

In 1973, however, the gradually expanding program in agricultural extension, whatever its strengths and weaknesses, was dramatically re-organized. From a national field-level agency, extension was transformed into a small office in the Agricultural Affairs Directorate of the MAAR with only 13 extension officers located around the country, one in each Mohafaza.

This unit has had some success, in spite of its small size, and aspects of this work were apparent at the time of this assessment. The public affairs section of the extension department, for example, has cooperated with the General Establishment for Cinema in producing five documentary films on various aspects of modern farm production. Six other films are now in the final editing phase with an ultimate target of sixteen films planned. According to Bakour, the office has sent 30 projectors to Mohafazat around the country. These have been giving an average of five showings per week during the summer and autumn seasons, when films can be shown outdoors at night (since there are few buildings in villages large enough to accomodate an audience for the films) (1978:50). Most of the Mohafazat offices I visited had working projectors. Few farmers I spoke to, however, had ever seen any of the Extension Department's films. Most Mohafazat centers had nationally made some of, which, agricultural engineers said, had little relevance to the Syrian situation.

Although the Office of Extension had at one time been involved in radio broadcasting, it no longer has a direct role in the program "The Farmer's Voice," which is broadcast each day in the late afternoon. The agricultural component of this program is now handled by some technically trained people, but most programming is done by the Peasant's Union and the State radio. Most farmers, however, find it difficult to listen to this program because it is broadcast at a time of day when most are still in the fields.

The publications unit of the public information section is one of the more successful units in the Directorate in terms of output. I found copies of their many pamphlets in nearly every office of the MAAR I visited. The major problem appeared to be one of distribution to farmers and getting the farmers to read and understand the publications.

One engineer said pamphlets were a dilemma to him. If he put them out at meetings "to let people know they were there," the farmers put them in their pockets and never read them. If he kept them in his office until somebody came to look for them, no one would know of their existence. The major use of the pamphlets appears to be in refreshing the memories of the engineers themselves, and to teach new techniques to those working in the office below them. It is hard to evaluate their effect on farmers, since questioning farmers as to whether they read pamphlets is unlikely to elicit a useful response, at least in the detail necessary to understand this rather complex situation. It is apparent that more study will have to be done to establish actual patterns of usage.

An experimental plots unit was also part of the extension system immediately before the present transition. This unit has been concerned with putting together technical packages for the demonstration plots which have been part of the duties of agricultural engineers at the Nahia level and some at the Mantika and even Mohafaza levels. These demonstrations stress new techniques and products such as seed varieties, fertilizer usage, insecticide usage and herbicides. The packages contain detailed instructions for the agricultural engineer, but there is little or no provision made to cover the cultivation of certain commodities throughout the entire country. Little modification is made on the local levels and instructions are automatically followed for the most part, whatever the result. The only decision made is whether or not to show the plots. The lack of adaptation of packages to local conditions limits the usefulness of the program, and although the attempt at broad coverage is commendable, the lack of local programming has a negative effect.

Farmers who participate in these programs supply land, labor and water for the demonstrations. The government supplies all inputs in the form of a package. The amount of help given to the farmer by agricultural engineers differs greatly from region to region, depending on the ambition and talents of the individual engineer. It is significant that every farmer I talked to seemed willing to have a demonstration plot on his land, in spite of the fact that he would get no compensation if the demonstration plot failed. Apparently the free inputs given to the farmer more than compensate him for the risk he perceives from trying the new techniques.

One farmer, for example, talked about a demonstration plot of watermelons grown on his land. The field was designated by the agricultural engineer; unfortunately it turned out to be too close to the road so that animals driven along the road got into the field and trampled the crop. Although the farmer lost his income from the field that year, he still seemed willing to have further demonstrations on his land.



One explanation for this continued participation of farmers appears to be in the way they are selected for these plots. We have mentioned that low-level agricultural engineers often serve their own Mohafaza, and that there was a tendency, because of this, for them to work within their own ethnic group. There are indications that this operates in the selection of fields for demonstration plots, with engineers often selecting members of their own kin groups to help in demonstration plots. Often an "easy-to-see" farm will be passed up for a "hard-to-find" farm of a kinsman, presumably because it is easier to get the kinsman to cooperate. Since the engineers' primary concern in these programs appears to be planting a specified number of plots each year, they often try to find the easiest means to satisfy quotas. More effort needs to be expended, therefore, in increasing the effectiveness of these programs by encouraging the engineers to more widely diffuse their information.

Agricultural engineers further indicate that they do not show plots which have failed, regardless of the reason. Although many people concerned with extension consider this ignoring of failures to be a good technique and feel that farmers must only be shown successful demonstrations, the practice has its negative aspects. The opportunity for both the farmer and the engineer to understand why the plot failed is often lost when this discussion and exchange of ideas does not occur. The "banker" must never appear to be wrong, even though the best farmers have failures and must doubt a program which never does.

#### 4.2 The Mohafaza-Level Extension Office

The Agricultural Directorate of each Mohafaza has an agricultural engineer specifically assigned to extension activities. He is responsible for seeing that extension programs from the Ministry are carried out within the Mohafaza (screening of films, demonstration plots, distribution of plots, organization of meetings, etc.). In addition, the Extension Head of Section has a role in preparing certain elements of future programs in extension to be submitted to the Director and the Agriculture Council, later to be passed on to the Ministry. The Directorate and the Mohafaza Extension Office are largely separate, as we have mentioned before.

The Mohafazat offices also organize, in response to their program directives, a yearly cycle of meetings, film showings and demonstrations keyed to seasonal factors and local commodity specialties. I was unable to see these programs since it was not yet the season for them and because it was still too cold for outdoor meetings. The basis for village selection was difficult to ascertain, but often the programs appear to be held at the request of the Peasants' Union or the local cooperatives. While stimulated by the requests of local farmer organizations, the program within the local agricultural office is very much oriented to holding a certain number of meetings and satisfaction of quotas.



Very little if any inquiry appears to be done on its effects, and the appeal of the programs appears to vary depending on the special interests of individual staff members.

The staff of the Mohafazat Directorates also determine programming for engineers doing extension in lower level offices. They have a program to determine the number of demonstration plots to be planted. The Mohafaza Extension Head can be called on by individual engineers within Mantika offices (through their Head of Section and the Agricultural Director) to help them solve extension problems. In most cases, however, extension work below the Mohafaza level appears to be largely nonexistent, except for that which is done incidental to administrative activities. This inactivity is in part the result of the reorganization now underway.

#### 4.3 Extension and the Administrative Activities of the MAAR

The flow of technical information between farmer and technician in the Ministry can occur in ways not usually defined as part of an extension program. Such flows appear to be important in Syria. Although many farmers prefer to buy their inputs from the private sector, it is the well-used right of every farmer in Syria to obtain credit from the Agricultural Cooperative Bank. The process of obtaining credit involves the acquisition of a licence from the MAAR and a requisition for supplies.

The licence is obtained from a local agricultural engineer working for the MAAR. In most regions, the farmer (or group of farmers organized in a cooperative) in conjunction with planning agents, decides on the amount of land he will devote to each crop (see Havens' report for more detail on how licencing works). The agricultural engineer then goes to a set of standard tables produced by the Soils Directorate at Douma and determines the necessary inputs required for each crop and enters it onto the requisition. Both forms are then taken to the Mantika office for rechecking and signed by the Section Head.

Very seldom are local modifications of standard recommendations in amount or type of input made. The soil is very rarely tested. The tables used by the engineers apply to all land of a given stabilization area for a given crop in the entire country.<sup>5</sup>

Plant protection is by necessity more specific. On the whole, this seems to be one of the most active sections of the MAAR. If a farmer has problems with plant disease or insect pests, he goes to a Nahia or Mantika level agricultural engineer who tries to determine the nature of the problem. If a diagnosis cannot be made, an expert from a higher level is brought in. The recommendation for inputs has to be checked by the Mantika Section Head and the local Mantika level plant protection specialist.\*

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\*Veterinary services are delivered directly to the farm, usually by an agricultural secondary school-trained technician.

Both agricultural inputs and plant protection chemicals are available privately, but the purchase price at the Agricultural Bank is usually lower than the private market price. In addition, the farmer does not have to pay for chemicals purchased from the Bank until after his harvest is sold. In spite of the many bureaucratic steps and time required, many farmers prefer to get their inputs in this way.

The double-checking of recommended dosages appears to be necessary (although it is often very cursorily done) because many of the field level technicians lack experience and their superiors expect them to make mistakes. It is also apparent that most of these offices are operating with one-third to one-half the needed number of agricultural engineers. This puts the bulk of this work onto the shoulders of senior-level engineers. Since most of the fertilizer distribution appears to be merely a simple calculation, a better way to utilize this level of personnel should be searched for.

The moments for establishing communication linkages between farmers and technicians are always limited. The procedure involving the licencing of production is a natural place to establish a relationship between farmers and agricultural engineers. Credit decisions are involved which can imply that the agricultural techniques of the individual farmer come under scrutiny; under such conditions the necessity for modification of those techniques can be assessed, programs planned and new techniques taught. This opportunity has been mostly lost except in the case of fruit tree production.

Although the licencing procedure appears to be a natural point of contact where technology transfer could take place, this function has not really materialized. Shortage of field personnel means there is little time to be devoted to modifying the national application norms toward local conditions. The shortage of personnel and of vehicles and the seasonal demand for their time also adds to the burden.

The cooperatives have simplified the procedure for the small farmer. By licencing all members of a cooperative at a single time, on a single form, some of the burden has been taken off of the engineers. However, the demand for those engineers falls within certain peak periods when all these inputs must be licenced and delivered. They therefore have little time to demonstrate new techniques to farmers during this most critical period. Likewise, even though the Bank keeps records of all transactions, no data have been collected on how the inputs are actually used. There are no estimates on how much fertilizer is sold by farmers for quick cash needed at the beginning of the season, and no indication of how much of these inputs are applied to other unlicensed crops. The process therefore adds nothing to the knowledge of either the farmer or the engineers.

#### 4.4 Special MAAR Projects: Some Alternative Models for Information Exchange

##### The Fruit Tree Production Project:

The Fruit Tree Production Project has been applied in Hama (outside of the Ghab region--see section 6 below), Lattakia, Aleppo, Homs, Sweida and Dar'a Mohafazat, as well as Nabk Mantika of Damascus Mohafaza. This program has two specific aims: first to increase fruit tree production by increasing the amount of non-irrigated land under orchards in both the cooperative and private sectors, and to reclaim orchards presently growing on irrigated lands; and second, to improve management practices on land under orchard cultivation in these areas.

In this program, agricultural engineers of the MAAR survey village land and allocate new areas as orchard. Training courses are then given to local farmers (575 farmers have already been trained in Hama in 18 courses). Local agricultural officials are trained as well. The courses stress the latest techniques for planting, grafting, spraying and harvesting.

This training is followed with incentive programs, where farmers who utilize the the techniques are given S.f. 20 per dunum (1 dunum = 1/10 hectare), in kind, of either insecticide or fertilizer. The management techniques of the farmers must be approved by a trained local agricultural engineer before these incentives can be obtained. Farmers are also given special prices on seedlings (S.f. 1 each instead of the retail price of S.f. 6 per seedling) and a low rental charge on the use of machinery. Loans are also made available through the Agricultural Cooperative Bank to encourage increased production.

Although only a few such programs are currently underway and only fruit tree production is involved, this type of program represents a new effort to combine information dissemination and incentives to encourage actual changes in agricultural practice. If this type of incentive program were to be utilized in other areas of production or combined with the licencing procedures discussed in section 3 above, there would be a better chance of actually modifying uneconomical agricultural techniques.

##### Rural Development:

According to Fort, the Rural Development Centers began as part of Syria's first Five Year Plan. They were designed in 1959 with the help of the Egyptians, based on their experience with their own Community Centers. These units are still in existence near Damascus, Dar'a, Sweida, Lattakia, Aleppo, Al-Hasakeh and Deir-ez-zor. Fort makes the following observations as to why the Egyptian concept might face difficulties in Syria; this is a summary of his points:



1. Density of Population: The population of Syria is less dense than Egypt and distances between villages are often great--a problem still relevant.
2. Level of Living: The level of living is higher in Syria than in Egypt. Many services performed by the Centers are available, and though costly are within economic means of Syrians.
3. Subject Matter Specialists: No provision was made for agricultural extension subject matter specialists, nor was the link between extension and research well-defined.
4. Boundaries: The independence of the Mohafazat Agricultural Directors created problems for organization beyond political boundaries.
5. Village-Level Workers: These extension units did not provide for village-level workers with a technical staff. The function of extension was left undefined. (ND:10-11).

The programs of these Centers continue to run, however, primarily under the control of the Ministry of Labor and Social Affairs. The program appears to be cut off from other major programs in other areas, although in the case of agriculture, the MAAR supplies the agricultural engineers and technicians. Most Centers appear to have a relatively small radius of effectiveness.

The advantage of this type of organization is that it places many types of services together in one place. This means that a villager can go to the Center to have help in solving many sorts of problems. The apparent failure has been in "extending" these multiple services into the villages by village-level workers. The idea of combined or integrated services is one which needs further consideration (see Lemel's report on the delivery of social services).

#### 4.5 The General Marketing Organizations

The General Marketing Organizations are the government-owned corporations created for the purpose of buying, selling and sometimes processing certain commodities so as to maintain control over certain areas of the national economy. Some of these corporations are connected directly to the MAAR. The Directors of these general organizations report directly to the Minister. These are the General Organizations for Seed, Cattle, Fisheries, Poultry, Machinery and Feed. In addition, there is the Cotton Bureau, which is one of the Directorates of the MAAR itself. None of these organizations, however, has any role in training farmers, either in the use or the cultivation of their products. This means that technical recommendations



on production which these organizations possess is distributed by other agencies of the MAAR. None of them have direct control of the application of the recommendations in the field. In addition, these organizations do not have the means for monitoring the effects of the application of their recommendations.

In the case of cotton, for example, this gap results in great differences in sowing techniques from one place to the next. Experimenters make recommendations for growing cotton, but get little feedback about the successes and failures of their techniques within certain localities. Local engineers have few instructions about what to do in the case of failure, and the farmers get discouraged and abandon the new techniques. If the Cotton Bureau or other similar organizations had access to adequate feedback, the problems in these situations might be better solved. Again, the problem here is not so much one of a fund of knowledge as it one of communication.

#### 4.6 The Ghab

The Ghab, an area of about 67,500 ha. of irrigable land located 35 km. west of Hama, is part of a massive drainage and land reclamation program which has been underway since the mid-1960s.

Lands drained under the Ghab program were considered State lands, and were to be either leased or allotted under the agrarian reform program. Since the area was traditionally poor and the peasants traditionally victims of usurious loan practices,<sup>6</sup> means had to be devised to assure credit and the supply of needed inputs at reasonable prices. A regionally planned agriculture in conjunction with the organization of farmers in cooperatives was found to be a solution to many of the problems of the past.<sup>7</sup>

The task of overseeing the general operation of all agricultural programs in the Ghab is in the hands of the Ministry of Agriculture and Agrarian Reform. The day to day supervision of agricultural activities is done both through the Organization for the Exploitation of the Ghab, which is headed by the Minister of Agriculture in Damascus, and the Directorate of Agriculture of the Ghab, which is run by a General Director in Skelbieh. Aside from the difference of names, the two organizations appear to be made up largely of the same personnel. The difference is that the General Director makes routine decisions and oversees the licencing and daily administration, while policy decisions must be made through the Organization for the Exploitation of the Ghab when the Minister takes the reins.

Both organizations have six Directorates (as they are called in the Organization) or Departments (as they are called in the MAAR Directorate). As far as could be determined, the Section Heads are

the same in both.<sup>8</sup> These six sections are: Administrative Affairs and Budget, Planning and Statistics, Husbandry Production, Rural Engineering, Plant Protection and Training and Extension.<sup>9</sup>

In addition to the six sections (all staffed by experienced agricultural engineers, many with higher degrees and training abroad), there are twelve Field Divisions, each headed by a fairly young agricultural engineer.

In 1969, UN/FAO said the following of the Ghab experience:

The extension services have been combined with the technical advisory services largely because, in practice, it is unlikely that separate qualified and experienced extension staff will be immediately available... It seems preferable to deploy and train the extension agents in a broader field of work initially, in positions where they can command authority (UN/FAO, 1969:195).

This combined responsibility essentially is still characteristic of the field section heads today, except for one thing: an extension and training department head now advises the field workers on extension matters through a monthly meeting, which includes the twelve Field Division Section Heads, the General Director and the Heads of Planning and Statistics, and Extension and Training.

Each field section is theoretically to be made up of an agricultural engineer as section head, two younger agricultural engineers to work with him and three or four observers (technical secondary school graduates). Each unit is to have a car, a driver, and some laborers. Each team handles all agricultural matters within an area of 6,000 irrigated ha.

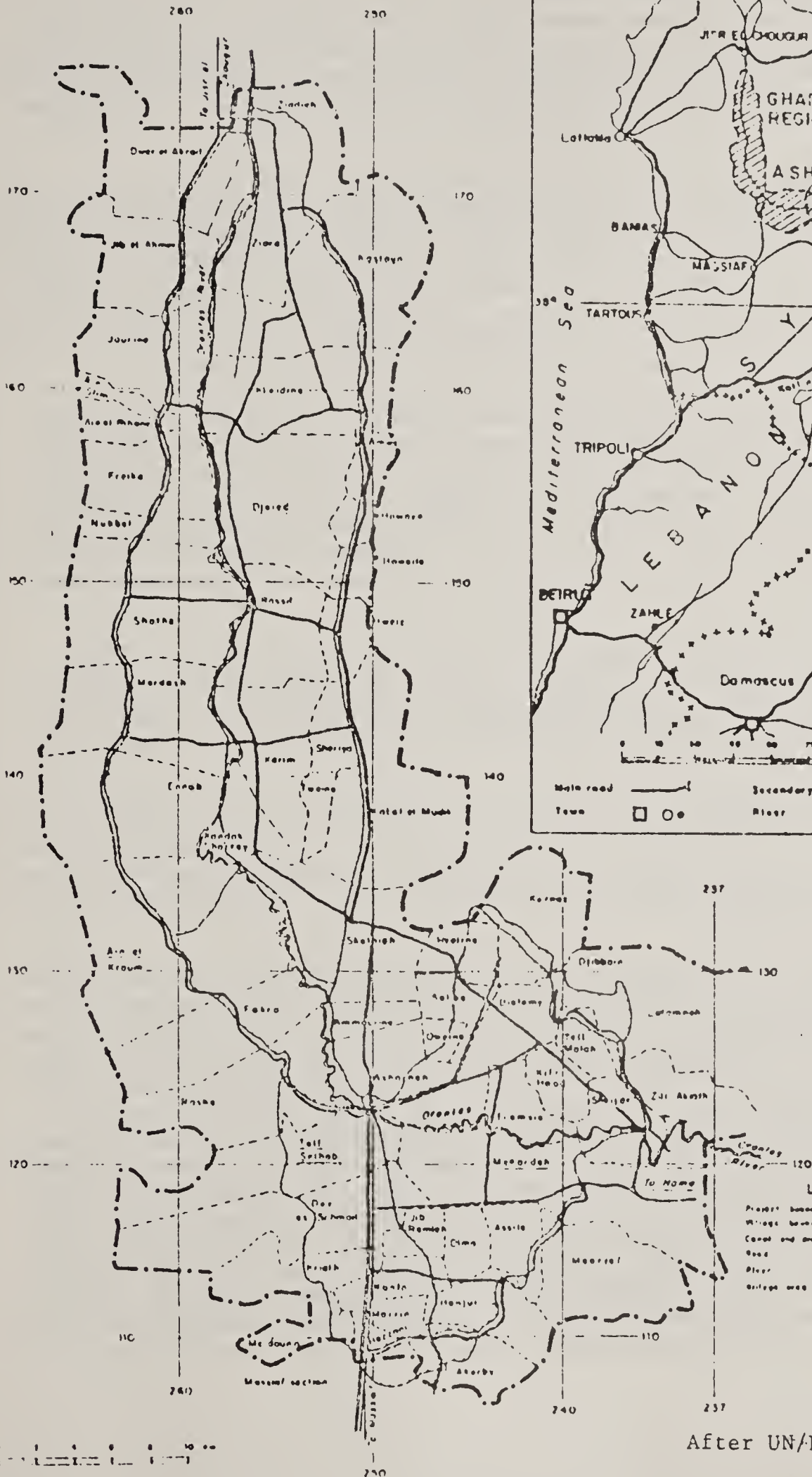
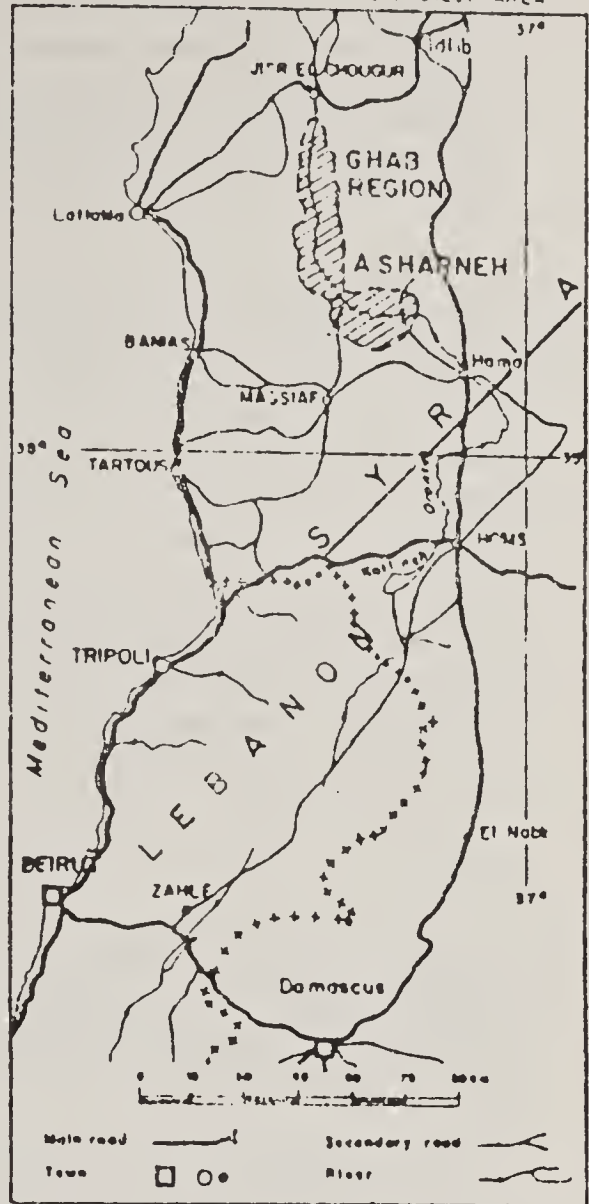
This ideal system, however, is plagued with chronic shortages of personnel. The actual state of affairs places field division strengths at one agricultural engineer (with about three years experience), two observers (secondary technical school graduates), and one laborer. As an example, one of the most active of these section heads spends about 70 percent of her time in the field and about 30 percent of her time in administration. She works a territory of about 10,000 ha., nearly twice the size of the ideal. She has a vehicle assigned to her for her work, but shortages in vehicles were noted in other areas.

Nearly all of the work of these section heads is overseen and rechecked by the General Director himself. However, his time is limited since there usually is a steady stream of farmers coming through for approvals of credit licencing slips and insecticide prescriptions. In addition to the Director's signature, farmers are also sent to the specialist in charge of the concerned department for his approval. The amount of time involved in paperwork for both the farmers and the staff is quite large.

# SYRIA - GHAB PROJECT AREA

MAP 1.

LOCATION MAP SHOWING THE PROJECT AREA



After UN/FAO, 1969

7-10 1969 - U. S. Bureau



In the Ghab area, according to the engineer in charge of extension, there are 24 demonstration plots for both summer and winter crops (maize, tomatoes, peanuts, safflowers, sunflowers, soya, wheat and cotton). Nine field days are held each year. Pamphlets are given to section heads for distribution. A movie projector is borrowed from Hama to show films several times each year.

The work of the MAAR is closely supported by the Peasant's Union and through them by the cooperatives. All agriculture in the Ghab is determined by the Plan of the Ghab which indicates which rotations will be utilized in which areas. Interviews with farmers indicate that there have been local experimental trials to support the preparation of the Plan. In one case, sugar beet trials were held on farmers' land. After these trials produced largely negative results, onions were selected for the Plan of the area instead.

In support of the Plan, since many of the farmers in the area are small land holders and beneficiaries of the land reform, the Peasant's Union organizes courses principally in the techniques for required rotations: wheat, sugar beet (or onion) and cotton. The Peasant's Union also encourages farmers to grow these crops as part of the Plan, often in spite of marketing problems and labor shortages. There are, of course, instances of unhappiness among farmers for having to conform to the Plan.

One farmer, a cooperative member, said he makes S.f. 12,000 growing cotton on his land. He said he could make S.f. 36,000 growing melons, "We are obliged to grow unprofitable crops. We have no independence and have no role in the decisions made for the plan."

Many farmers in the Ghab are not members of the cooperatives and are very assertive of their independence. These farmers say that they are not invited to training sessions given by the MAAR. Many claim, however, that little that is taught in these courses would be new to them.

Certain problems observed in the Ghab are common in other areas as well. One problem is the amount of confidence farmers have in the MAAR people. Confidence, or lack of it, is fundamental to the communication of new ideas in agriculture and yet there are competing sources of information which tend to undermine confidence in public officials. An example of this competition occurred in the Ghab when a farmer came into the MAAR office with an insecticide prescription written by a field section head. It listed the chemical by its brand name. The plant protection officer crossed out the brand name and wrote in the generic name of the insecticide. He said it was because the brand name was not available at the Bank office at that time. The farmer refused to believe that the two chemicals were the same. Nothing could convince him, not even the word of the Director himself. He finally went storming out of the office feeling he had been cheated. The farmer had, it seems,



noticed many billboards in the vicinity erected by a chemical company listing the virtues of that particular brand. He also may have had personal contact with a company representative, since some farmers claim to have gotten their "extension" information from engineers working for private companies as well as from MAAR technicians.

When farmers were asked where they went for agricultural advice, it was apparent that the MAAR has made inroads in affecting the use of fertilizer and insecticide. Farmers are aware of new technologies and are interested in such things as herbicides, but find they have trouble getting information on how much to use and when.

In spite of these problems, the change in the Ghab is phenomenal. After reading the descriptions of the area written by Dodd (1934), one sees that great progress has been made in health, sanitation, agriculture, education, communications, and roads. The system of delivery of agricultural services seems better in the Ghab than elsewhere in the country, since there are a larger number of experienced engineers and other technicians in the area. Whatever shortcomings we have found in the Ghab only indicate that greater problems are present elsewhere.

#### 4.7 State Farms

There are presently 13 State farms within the SAR concerned primarily with crop production. This accounts for 84,144 ha. of land or only about 0.45 percent of the national total of cultivated land (see Table 3). State farms are managed by agricultural engineers utilizing hired labor to handle all on-farm labor operations. The engineer is primarily an overseer, and he is concerned more with allocating and coordinating labor than with serving the training or guidance function he has to fill elsewhere in the MAAR system.

Some training programs do have to be created in order to permit efficient operations of the farms. In Al-Hasakeh Mohafaza, for example, I found training programs were given for those who would operate mechanical equipment (e.g., harvesters, tractors, etc.) for the farm. Since the equipment operators were hired, often at relatively low wages, there was little to keep them working on the farms after completing the courses. Many of these hired laborers leave the farms and go to work for private landholders.

Direct training is only one use of State farms for training purposes. Another case in Al-Hasakeh Mohafaza shows that State farms are used to demonstrate the utility of new techniques--a type of large-scale demonstration plot. On that farm, the new technique of aerial spraying of herbicides was first demonstrated to farmers in the Kamishli area. These demonstrations are usually side-effects of basic production objectives, however, and not a conscious attempt at the communication of new information.

Table 3. State Farms for Plant Production, 1977

Farm's Name	Loca- tion or Moha- faza	الحيوانات Animals		المساحات المزروعة ونتاجها Area and Production												المساحة الإجمالية مكترا Total area (he)	
				اشجار مثمرة Fruit		محاصيل ملب Pastoral crops		محاصيل صناعية Industrial crops		خضراوات Vegetable		بقول Legumes		حبوب Cereals			
		ايل Cows	ايل Sheep and goats	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	انتاج (طن) Prod. (T)	مساحة (هكتار) Area (he)	Total harve- sted area	
Damascus State farm	Damas- cus	-	-	869	269	-	-	-	-	-	-	-	-	-	-	269	269
Dejleh State farm	Al- Hasakeh	-	-	-	-	-	-	-	20	-	-	163	2229	1043	15623	17872	37224
Derbasieh State farm	Al- Hasakeh	-	-	-	-	-	-	-	-	-	-	45	335	983	1555	1890	2000
Ras El -Ain Sta- te farm	Al- Hasakeh	-	-	-	-	-	-	-	-	-	-	-	-	3239	4484	14484	30663
Ain Al-Zarka farm	Al- Hasakeh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	428
Al-Manajeer farm	Al- Hasakeh	-	-	-	-	-	-	219	153	-	-	-	-	671	400	553	639
Kamishly State farm	Al- Hasakeh	-	-	-	-	-	-	-	-	-	-	27	136	30	19	155	326
Sa'lo farm	Deir-ez- Zor	-	-	-	48	210	21	55	58	139	18	-	-	75	145	290	859
Al Snial farm	Deir-ez- Zor	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Al Rasheed farm	Al-Rakka	-	-	-	-	-	-	48	90	-	-	-	-	3648	6609	6699	11289
Abou Feras Al Hamadani farm	Aleppo	-	-	24	127	-	-	-	-	-	-	-	-	135	82	209	209
Al-Hourieh farm	Lattakia	-	-	1778	204	-	-	3	5	-	-	-	-	18	16	225	238
Al-Rouj farm	Idlib	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total		-	-	2671	648	210	21	325	326	139	18	220	2700	9236	38933	12646	84144

After Statistical Abstract  
Table 24/4 p.226

## 5. The Ministry of the Euphrates Dam

The Ministry of the Euphrates is divided into the General Organization of the Euphrates Dam (GOED) and the General Administration for Development of the Euphrates Basin (GADEB), which together are concerned with all activities within this project area. GOED concentrates on the engineering aspects of the Dam itself, and thus does not concern us here. GADEB, however, is in charge of all agricultural and social projects within the Euphrates Basin--including running of pilot project farms, training programs, resettlement projects, and reclamation projects--from the building of irrigation networks down to the development of tourism. It is a massive undertaking which has been the subject of many evaluations and reports. Rather than cover the subject intensively, only the special "extension" features of this program which might account for its superior results will be noted. It should be indicated that many of the effects of this project may not be felt for many years.

1. The GADEB, unlike offices of the MAAR, is able to select engineers in lower-level jobs from any section of the country, not merely from Al-Rakka Mohafaza.<sup>10</sup> It apparently can borrow personnel from the MAAR, even though it is independent of it. Interministerial transfers do take place, however, as in one case where an engineer in GADEB indicated that his next promotion would be to the MAAR in Damascus.

2. The GADEB is attempting to work out a coherent and all-inclusive development strategy or plan. This plan has made use of several innovative techniques, including some basic social research (cf. Gattinara, 1973) to determine local leadership patterns and organization, agricultural trials to determine the best crop rotations, and ecological studies to determine the nature of the larger milieu. These base-line studies are to be followed by activities which will monitor the effects of the Plan on physical, biological and social aspects of the area which will in time allow modifications in the Plan as it gets underway.

3. The GADEB maintains control of all social services within the pilot project areas and attempts to coordinate with relevant ministries outside of these areas (see Owen, 1979). As a result, there should be more integration of the services in this region than in other areas of Syria.

4. GADEB itself operates 15 large farms. Thus, "extension services" for individual farmers are not important. The emphasis is on on-the-job task supervision rather than on influencing the dependent decisions of numerous small farmers. Training is concentrated on managers, who in turn train their subordinates in the use of inputs on specific crops.



5. The Plan is organized in a step-wise fashion. What is learned at each stage is applied in the next phase of expansion. This means that the plan will take into account necessary modifications and training of personnel for the next phase while experimentation continues at an earlier stage.

The system does present a major liability, however, even given its goals. Much of the country's best planners and most effective engineers are being siphoned off by this project. This means that some of the most innovative planning is being done in one small region of the country, as important as it may be, while very real problems in other areas are being largely neglected. Many projects which have been underway for a good many years, such as those in the Ghab, for example, are now being somewhat neglected in order to permit the concentration of talented manpower necessary to coordinate the Euphrates Plan.

As in most countries, there is limited managerial manpower and infrastructure in the SAR, but much of the more developed of these resources appears to be concentrated in the Euphrates Project area. Table 2, for example, shows 113 agricultural engineers working in the Euphrates Basin in 1976. The number itself does not seem excessive, especially considering the enormity of the task, but the ability of the GADEB to pick its engineers from any department indicates that a good number of the best engineers are being concentrated on tasks in this area.

The Euphrates project must be seen as a high-risk venture, a social experiment, with great potential pay-offs. However, to succeed as an experiment means that more than just one area must be irrigated and production introduced. Special measures have to be in place to rapidly transfer what is learned in an experiment to other agencies or ministries, or else what is learned there will be lost through increased neglect of older projects and loss of personnel.

## 6. General Union of Peasants and Cooperatives

The General Union of Peasants is organizationally independent of the MAAR, but has a close working relationship with it. The Union has its own data gathering unit (within its agricultural affairs section) which provides needed information to regional and national coordinated planning councils which design agricultural policy at all levels. The Union provides the major input from the farmers themselves into higher policy-making councils. At the same time the Cooperative Law (see Ministry of Agrarian Reform Law No. 161 of 1958 and its Amendments, Law No. 88 of 1963) allows the Peasant's Union to draw technical personnel from all relevant departments including the MAAR to help them undertake their programs. The MAAR, therefore, pays many agricultural engineers who are working with union officials for the Peasant's Union. The two organizations, although independent, are closely intertwined.



The local manifestations of the Peasant's Union are the cooperatives. Of 3.867 million ha. of cultivated land in Syria, 0.881 million or about 23 percent is under the cooperative system (see Table 5). There were 3,452 cooperatives in 1977, with a membership of 267,265 farmers. This number is identical to the number of members in the Peasant's Union itself (see Table 6). The two organizational structures were merged in 1976, so that to be a member of a cooperative is to be a member of the Peasant's Union as well. Both are, therefore, composed of small landholders and recipients of land under the agrarian reform program. This is largely the audience the MAAR wishes to reach in technical and agricultural transfer programs. Larger farmers, those in the private sector and landless sharecroppers or hired laborers are not directly represented by this organization at present.

Given actual operations, membership in a cooperative brings certain specific advantages to the small landholder. First, a purchasing cooperative gives a member a somewhat better price on inputs obtained from the Agricultural Credit Bank. The actual difference in price, however, is often small. The second advantage is that the cooperative combines the cropping plans for all small holdings into a single agricultural plan. All inputs are bought together, and the licensing procedures of all small-holdings are handled at one time, on a single form. The small-holding cooperative member is freed then from the paperwork and trips to the Mohafaza center that are constantly part of the credit-seeking non-member's life. In some regions, the combining of smaller plots into a single agricultural plan permits the purchase and economic usage of agricultural machinery over the resulting large tracts of land. (See Haven's report for more on the cooperatives.)

Theoretically each cooperative or group of cooperatives has a full-time agricultural engineer working to help with the technical problems of coordination and advise on new techniques. In actuality, personnel shortages have forced three alternative systems to operate: (a) an agricultural engineer on the Nahia or Mantika level of the MAAR looks in on several cooperatives as part of his list of other duties; (b) a lower-level agricultural specialist (secondary school trained technician) lives on or near the cooperatives; or (c) a mid-level specialist (two-year level) is paid by the MAAR and tours six or seven cooperatives within an area on a regular basis.

It is important to note that the cooperatives and Peasant's Union have greatly improved the leverage of their members in obtaining services from the MAAR and other government agencies. One contributing factor is the fact that the head of the local Peasant's Union and the Agricultural Director of the MAAR are both invariably party members. The party structure presents yet another direct linkage to decision making which can be utilized when an individual needs certain services. Farmers indicated that this linkage usually gets results.

TABLE 5: Number, Area and Members of Cooperatives by Mohafaza, 1977.

Mohafaza	Total	Planted with Trees	Non-irrigated*	Irrigated	Number of Members	Number of Coop- atives.
Damascus	93	14	41	38	27821	244
Aleppo	320	25	282	13	31405	638
Homs	141	9	111	21	21496	360
Hama	156	6	106	44	34931	319
Lattakia	33	7	21	5	14257	265
Deir-ez-zor	55	0	-	55	23853	129
Idleb	132	25	102	5	27392	386
Al-Hasakeh	147	2	131	14	20988	349
Al-Rakka	55	0	40	15	10994	146
Sweida	66	5	61	-	11557	129
Dar'a	65	1	59	5	9246	132
Tartous	78	41	29	8	28154	291
Quneitra	13	2	10	1	5171	44
Total	1354	137	993	224	267265	3432

\*Fallow land and pasture are included in non-irrigated areas.

Source: Statistical Abstract, 1978. Table 26/4, p. 228.

TABLE 6: Peasant Confederations, Federations, Unions  
and Their Members--1976 and 1977

Mohafaza	Year	Members	Unions	Federations	Confederations
Damascus	1976	25539	239	7	2
	1977	27821	244	8	2
Aleppo	1976	27607	701	7	1
	1977	31405	638	8	1
Homs	1976	19300	359	6	1
	1977	21490	360	6	1
Hama	1976	34855	318	5	1
	1977	34931	319	5	1
Lattakia	1976	13155	260	4	1
	1977	14257	265	4	1
Deir-ez-zor	1976	32386	117	3	1
	1977	23853	129	3	1
Idleb	1976	27117	380	5	1
	1977	27392	386	5	1
Al-Hasakeh	1976	17420	321	4	1
	1977	20988	349	4	1
Al-Rakka	1976	10255	140	2	1
	1977	10994	146	2	1
Sweida	1976	10255	123	3	1
	1977	11557	129	3	1
Dar'a	1976	7552	130	2	1
	1977	9246	132	2	1
Tartous	1976	25772	283	5	1
	1977	28154	291	5	1
Quneitra	1976	4843	42	2	1
	1977	5171	44	2	1
<u>TOTAL:</u>	1976	256036	3413	55	14
	1977	267265	3432	57	14

Source: Statistical Abstract, 1978. Table 13/14 P. 623

Note: Peasant Federations are the collection of Unions operating at the Mantika level. Confederations are the collection of Federations operating at the Mohafaza level.

The Peasant's Union offers special training courses to members. Non-members can attend, although few do. There are two types of special courses available: short courses which accounted for 97 percent of the farmers trained in 1978 and involved 183 courses of six-day duration, and long courses (5) which last from 90 to 145 days (Peasant's Union personal communication). There are other courses as well (see Table 7) which help train the leadership of the organization (such as the course in rural leadership offered to Mohafazat chairmen of the Peasant's Union or the elected farmers, leadership courses offered to members of the Mohafazat Peasant's Union boards, etc.) as well as training programs for advisors (agricultural engineers, graduates of universities and graduates of agricultural vocational schools working in the Union). These courses largely concern policy issues and orient the trainee toward the goals of the Peasant's Union.

The longer courses are in accounting (to farmers with preparatory school certificates who are selected to keep the records of individual cooperatives) and in machinery (for those selected to drive and maintain the cooperatives' agricultural machinery).

The short courses for farmers are more varied in nature and are taught in Mohafazat centers throughout the country, as well as at the Peasant's Union Center in Damascus. These courses each have from 20-30 participants and include specialized training in insecticide usage, field crops, horticulture techniques and the like.

Farmers who take these courses are selected by the local cooperatives and are placed "under obligation" to go. Farmers are paid S.f. 8 per diem for meals (and are generally expected to return home each night) or S.f. 150 per month for long courses where they are expected to remain in the district center.

This system of training farmers and aiding in the information exchange process has encountered several problems, however:

First, the difference in age and practical experience between the agricultural engineers who teach these courses and the farmers who take them is often significant. It is difficult for farmers to take instruction from younger teachers--especially in a society where age is often taken as a sign of increased wisdom.

Second, the technical level of these courses is not so high as it should be (see Bakour, 1978) and there is too little practical information given to the farmers to warrant his taking the time to go to the courses. Representatives of the Peasant's Union were very frank in admitting this problem and are now seeking ways to improve this state of affairs. This should be commended and encouraged. If the content of the courses and the quality of instruction are improved, farmers will be more easily attracted to come.



Finally, there is the problem of inadequate per diems. Although the budget is understandably limited in the area of training, a farmer sees his time as being worth S.f. 50 per day, according to a spokesman for the Peasant's Union, compared to the S.f. 8 he receives for attending a short course given in a Mohafaza center. Farmers' perceptions are that very frequently the technical information received does not compensate them for the lost revenue. It appears, however, that if the level of instruction improved, the balance might change and willing attendance could increase with little change in the per diem rate. Instead of focussing on methods of improving curriculum by means of more farmer participation in the design of courses, however, the present system is one of quotas, where each cooperative is obligated to register a certain given number of trainees to assure the filling of the courses given each year. Since farmers prefer not to attend the courses and use what influence they have to get out of going, only those with little or no local influence end up having to take the courses as the cooperative representative. Hence, even if the courses were first-rate, they are attended by many individuals least able to influence other farmers in the cooperative or to transfer what they have learned to these farmers. By improving the quality of instruction farmers could be increasingly attracted to these courses and, more importantly, influential farmers could be attracted with little change in budget. Table 8 presents some of the other programs available to farmers according to Bakour. Table 9 indicates the rate at which trainers and other individuals responsible for the farmer training programs are being produced.

The Peasant's Union is also trying to open some special stores within cooperatives in seven Mohafazat. For the time being, these stores will specialize in the sale of insecticides. Each shop is supposed to utilize the services of an agricultural engineer and an accountant. The purpose of the shops is to convince farmers to use insecticides properly. After more experience is gained, these shops will expand into other services and areas.

I was unable to visit one of these shops but even in theory their purpose is unclear. The shops are apparently designed to eliminate private middlemen who charge excessive prices. However, in areas where the ACB is active, such shops would be able to offer little that is not already offered by the Agricultural Cooperative Bank (see below), which is supposed to supply inputs, including insecticide, to members of the cooperatives, or by the agricultural engineer or similar workers already assigned to the cooperatives for technical assistance purposes. If these stores utilize additional resources to duplicate roles already fulfilled by existing institutions, it is a waste of already scarce personnel. Although I may have mis-understood the function of these shops, as stated it appears to too narrowly define the ways in which broadly-trained agricultural engineers are to be employed.

TABLE 7: Peasant's Union Training Plan for 1977

Training Plan	Number	Trainees No.	Trainees' Qualifications
Rural Leadership	1	13	Elected chairmen of the farmers Cooperative Union Mohafazat.
Elected Farmers Leadership in Mohafazat	3	60	Elected members of the board of Farmers Union in Mohafazat.
County Farmers' Leadership	10	190	Elected members of board of Farmers Units
General Farmers Union Officials	5	65	Graduates of different university departments working as directors in Farmers Union
Agronomists working in the Union	2	60	B.A. in Agriculture
Animal Husbandry	1	20	Graduates of agricultural vocational schools working in the Union
Ag. Advisors	15	340	Graduates of agricultural vocational schools working in the Union
Accountants	12	240	Farmers with preparatory school certificate working as accountants with coops
Administrators	11	330	Officials working as administrators
Farmers training on different subjects in each Mohafaza	187	3992*	Farmers
Rural Industry (Carpet weaving)	46	1150	Farmers and their families
TOTAL	293	6395	

\*This figure is presumably the correct one, even though in the original report (in English) the figure given is 392 which is far too small.

TABLE 8: Training Programs Available to Farmers  
in the SAR, 1976-1977

Office Delivering Program	Program Offered	No. of Farmers Trained	No. of Pro- grams or Classes/year
MAAR: Education Directorate	Ag. & Veterinary secondary schools	1219	8 (1977)
Training Direc- torate	Training courses	1397	N.A. (1970)
		1842	" (1971)
		812	" (1972)
		2083	" (1973)
		2197	" (1974)
		1200	" (1975)
		1496	" (1976)
		---	" (1977)
Peasant's Union	(see Table 7)	6395	293 (1977)**
		3060	154 (1976)**
	Technical Training	3183	176 (1977)
		1100	73 (1974)
Min. of Labor and Social Affairs	Rural Industries Training	1717	55 (1976)
	Countryside Recreation Centers		
	(a) Rugs + Tricot	466	19 (1977)
	(b) Illiteracy	1284	55 (1977)
	(c) Home Economics	381	17 (1977)
Institute of Peasant Education:	(a) Central	Leadership	
		73	1 (1976)
		95	1 (1972)
	(b) Branch	124	1 (1968)
		Leadership	
		719	N.A. (1976)
		1767	" (1972)
Ministry of Euphrates Dam: (GADEB)	Literacy Peasant's Education Driver & Mechanics	185	" (1969)
		780	37 (1977)
		65	2 (1972-77)
		426	20 (1972-77)

\*\*Planned, not actual figures.

Source: Y. Bakour, 1978 passim.; and Statistical Abstract, 1978, p.489  
Table 19/10.

TABLE 9: Management and Trainer Training Programs, 1976-1977

Office Delivering Program	Program Offered	No. of Managers or Trainees	No. Of Programs (Year)
Ministry of Agriculture and Agrarian Reform	Management Trainee	2103	207 (1977)
Peasant's Union	" "	600	31 (1976)
Ministry of the Euphrates Dam	" **	1797	7 (1977)*

\*Planned

\*\*Includes drivers, mechanics and electricians

Source: Y. Bakour, 1978. passim.



## 7. General Organization for Tobacco

The General Organization for Tobacco, or the Tobacco Monopoly, is connected with the Ministry of Economy and External Trade, not the MAAR, and is responsible for all phases of the tobacco industry, including research into tobacco, the making of cigarettes, and the enforcement of tax regulations. For our concerns, however, it is the only such special organization which does not rely on the MAAR to transmit relevant technical information to farmers. The Tobacco Monopoly does its own extension work.

Concentrated largely in Lattakia and Tartous Mohafazat, the Tobacco Monopoly licences all tobacco agriculture. To get a licence, a farmer has to certify that he has certain types of soil on his land and his land must be within a specified area. He is given a licence and assigned to grow tobacco on a specified amount of land. Since tobacco is a highly profitable crop, most eligible farmers want to be licenced to grow it. The Monopoly restricts the amount of land which can be cultivated, however, which results in more farmers wanting to be licenced than can actually be accomodated.

The situation has proved helpful to those involved in spreading new agricultural techniques among farmers. One example of this is in the history of the diffusion of the use of plastic tunnels to protect tobacco seedlings before transplanting. According to the Tobacco Office in Tartous, the use of these tunnels reached 100 percent of the farmers within a year of introduction. This was accomplished by making licencing contingent upon use of the new technique and by handing the materials and instructions along with the licence and the seed.<sup>11</sup>

## 8. The Agricultural Cooperative Bank

The Agricultural Cooperative Bank supplies Syrian Farmers with low-cost subsidized credit in both cash and kind. In addition to supplying financial credit, the Cooperative Bank directly supplies major inputs needed for agriculture at lower-than-market prices. Credit from the Bank is obtained through the licencing procedures outlined above in the section on administration. Although there is no guarantee that a farmer will use these inputs according to the instructions of the MAAR, there is a potential for a great deal of control over farmers' methods utilizing this link.

Farmers who were interviewed see the Agricultural Bank as a means of making possible changes in their agricultural practices. In one case, a farmer said that he converted from crop to orchard production by means of a pump bought, in part, with a loan from the Bank. The Bank's role in specialized programs, such as the fruit tree

intensification project described earlier in this report, shows that it is sometimes used by the MAAR in a coordinated manner, to supply inputs so as to encourage the use of certain production techniques. The fact that farmers have difficulties in getting credit for growing low priority crops in certain areas is generally enough to discourage the growing of these crops. The Bank must be seen therefore, as part of the agricultural information system and as a potential regulator, encouraging some types of agricultural decisions while discouraging others.

At the same time, some farmers prefer to remain outside of this system, and it appears common for farmers in some areas of the country to borrow money from relatives, neighbors, and other sources. In additions, farmers rely on the larger landlords or merchants for credit. Some wealthier farmers deal strictly in cash, and continue to buy their inputs from private merchants. The reasons for these transactions are complex and should be part of long-term studies of local economic practices.

### 9. International Agencies

International agencies attract many of the most able Syrian agricultural engineers away from government service by offering higher salaries and promising access to higher education and more challenging careers. Some of the programs are well designed, but unfortunately in most cases have only indirect effects on the delivery of services and in particular on the delivery of technical information to Syrian farmers.

Many of these organizations, such as FAO, are concerned with planning and advice to the government. Others, such as ACSAD and ICARDA are oriented toward research and the testing of new varieties or techniques within the SAR. Although both FAO and ACSAD have field projects, information on their "extension" activities is scant, and this report will not discuss them. ICARDA has given some consideration to the communication problem which deserves some analysis as a means by which interaction between farmers and government agricultural engineers can be increased to the mutual benefit of both.

ICARDA is doing a series of trials in various stabilization areas to compare the productivity of wheat varieties under varying conditions and cultivation techniques. What is unusual about this activity in the Syiran context is the kind of information being sought and the way in which information about technology is exchanged (cf. News from ICARDA, No. 1, March, 1978).

First, preliminary research is done to get basic data on the test area. This includes data on physical, biological and socio-economic factors which affect farming systems. Then the farming systems themselves are studied and defined. Trial programs called "Field Verification Trials" are established and are carried out in such a way as to maximize the participation of the farmer in both cultivation activities and in the evaluation process.

The farmer is involved in every operation of the "field verification trial." He sees new techniques performed by a technician and he has a chance to try them by himself. All activities are undertaken with the farmer present. The verificant trials are put in highly visible areas, and other farmers are encouraged to watch the techniques and participate if they choose. Their comments are always invited, and the engineer answers questions they might have. The plots themselves combine different varieties of seed (including the farmer's own seed) and utilize new cultivation techniques. These are grown in close proximity to the farmer's ordinary fields so that passersby and the farmer himself can compare the various types at any stage of growth. Special harvesters are used so that differences in yield can be noted. The opinions of farmers on each variety and on the cultivation methods are recorded and evaluated. Farmer's opinions are integrated into the program as far as possible and are taken seriously in further planning. This allows ICARDA to modify their programs in precisely definable ways to maximize future audience acceptance.

Other steps are then taken. The engineer in charge of the program knows enough about rural societies to be able to define what a socio-economically "average" farmer is like within his area. He is thus able to precisely determine, within local terms, what different types of farmers he is working with. Programs then can be modified to reach a specific audience within an area if that is desired.

What is significant about ICARDA's method is that it encourages two-way communication between agricultural engineers and farmers: the technician learn from farmers and teaches them at the same time. Most importantly, it gives both the farmer and the engineer tangible results which can lead to an improved basis for agricultural decisions. Although this technique is used here only for wheat trials, there is no reason why it cannot be modified for use with other crops as well. (cf. ICARDA Project Report, No. 1, November 1978).

The secret of ICARDA's success appears to be in their training program for the engineers carrying out the trials. This program attempts to change the attitude of the engineers to be more favorable about working directly with farmers. First, time is taken to improve the agricultural engineer's basic competence in practical agriculture (it should be recalled that engineers often feel that their formal education was weak in practical training). Apparently



this increases their confidence and consequently increases their willingness to participate in two-way interactions with farmers.

After the practical training comes the actual field verification trials. The engineer's first experience is monitored in order to maximize his own learning, but subsequently the trials are conducted to fulfill actual research goals. These trials help the engineer to gather data for planning and to organize his later tasks in an area. The routine nature of the trial gives him a reason to be in the area and an excuse to introduce himself around to farmers. The engineer's training allows him to gain a basic understanding of local social variables and the place of individual farmers within the local system, as well as helping him increase his understanding of local farmer needs. This technique should be considered as a first step by the MAAR for increasing the ability of field level engineers to approach their work in a thorough and systematic way. It is recommended that at least the staff of the MAAR Extension Directorate concerned with the new In-Service Training Unit undergo the ICARDA training program in order to gain insight into some of the excellent philosophies of this program and to help them modify elements of the program for their own use.

#### 10. Summary and Recommendations

Figure 4 presents a schematic diagram of some of the organizations which we have discussed, and their interrelationships in terms of the direction of communications flow between them. Although the possibilities of changing established patterns of communication is always limited, close inspection of those patterns can suggest areas of programming which need to be strengthened.

We have noted, for example, that transmitting of information between organizational levels takes place only between the executive offices at each level. Thus the Head of Section for Extension at the Mohafaza level is supposed to communicate to the Extension Directorate only through the Mohafaza Agricultural Director. The Mohafaza Director will generally contact the National Directorates, such as Extension, through the Minister's office, unless the problem is of a minor kind. It is then up to the Minister to contact a Director to allocate the problem to one of his staff. Thus no special office has a continuous structure throughout the MAAR chain of command. Each service, on each geographic level, represents a "cabinet office" to the executive in charge at that level, creating a discontinuity between levels of government and regions at the same level.

Even more striking, however, is the great number of quasi-autonomous agencies which utilize the MAAR as their only means of transmitting information to local offices and farmers. Thus the General Organizations, for example, are only linked through the Minister's office to the Mohafazat offices, the Mantika offices





and to the farmers themselves. Likewise the farmers, the cooperatives, the Agricultural Cooperative Bank, the General Feed Organization (not shown), the Peasant's Union and the local agricultural engineers are only inter-linked through the Mantika Head of Service, the executive at this level.

Since we are concerned primarily with technical information, this means that a problem with a crop or production technique in one of the General Organizations would have to be transmitted to the Minister's office and from there, for example, to the Plant Protection Directorate. A problem with a crop within a certain Nahia might then be called to the attention of the agricultural engineer, who would then contact the Mantika Head of Service. If he thought the problem was important, he would contact his engineer concerned with plant protection. If no solution could be found at that level, the problem goes to the Mohafaza Director of Agriculture, who in turn contacts his plant pathology Head of Service. If he has no solution, he can call Damascus by radio, but a sample may have to be sent in. The link at last is made with the man who had received the new technique from the General Organization's researchers in the first place, and the solution is returned down the line to the farmer.

In this system, the linkages are present and the services are there, but as many farmers and local-level engineers noted, services often come too late to be of benefit. The information has not flowed swiftly enough in many instances.

The present system is based on preventing the limited resources of Syria from being unnecessarily overburdened. One doesn't use highly trained specialists for routine problems, so the Directors serve the function of "gatekeepers," allowing only severe problems to move up to the next higher level of expertise. Unfortunately, the Director, already overworked in his policy setting (on the Agricultural Council with the Peasant's Union and Party) and his administrative roles, becomes overloaded and cannot act effectively as a gatekeeper in all areas, as he is expected to do. Even with his assistant (whose job is concerned almost entirely with agricultural affairs), there comes a point where the system will simply no longer function. Strong direct linkages must be established between the specialized offices at various levels, both in programming (downward flow of information) and data collection or monitoring of program effects (upward flow of information). This would be the role of the executive as coordinator of efforts within a single level, yet would be a move towards increasing the number of parallel channels for information diffusion.

Other ways in which the number of parallel channels could be increased is through giving more power to the General Organizations for doing their own extension operations, or at least encouraging them to monitor the applications of their own research so that their programs can be modified to face the realities of applying programs in the field (as in the case of the Tobacco Monopoly).

In addition, the effect of radio as a parallel channel of communication could be increased with a few minor modifications and little rise in cost. These are: include the MAAR among the inputs for scripting (along with the Peasant's Union and the Syndicate of Agricultural Engineers); and change the time of broadcasting from late afternoon to early evening to catch farmers after they return to their homes from their fields.

The Peasant's Union training programs could also provide additional parallel channels for information diffusion. Their programs must be improved, however, both in terms of technical content and farmer incentives for coming. As long as farmers do not want to attend these programs they will have little effect. The desirability of the programs in repair and maintenance of agricultural vehicles show that increased technical relevance is often enough to increase course desirability without increased monetary incentives.

Finally, the Peasant's Union should begin to utilize the agricultural engineers on its staff in more field-level training programs, in addition to its classroom-style programs. These can be instituted as follow-up programs in cooperatives that have recently sent farmers to attend classes in the institute center. By sending an engineer or technician back with the trainee, the Peasant's Union would lend support to him in helping to convince others to utilize new methods. The short visit of the engineer (perhaps for one week) would allow the trainee enough support so that he could begin to talk about what he has learned.

The basic problem of rural services in Syria, however, remains one of attitude. There is an emphasis on what Felstehausen has called "narrow-spectrum" services, with "office-bound methods and symptomatic treatment." As in Colombia, the question is one of whether extension should treat merely individual and farm problems or infrastructural problems as well. He notes that

Extension agencies in most parts of the world have by tradition concentrated on biological, physical and personal factors. Infrastructural requirements have been left to local governments and community level action organizations. (1969:14).

Given the limited delivery of these services on the rural level in Syria, it seems unlikely that any purpose would be served by continued separation of this function.

In 1955, the IBRD made the following recommendation for extension in Syria,

The mission has given considerable thought to the problem of organizing effective work among the agricultural population in villages. Our conclusion is that this work would best be entrusted to a special



rural community development organization...The justification for a special organization rests primarily on the fact that a properly conceived village improvement program transcends the bounds of agriculture. Its principal task will always be to raise the standards of agriculture and animal husbandry, the source of livelihood of the villages... Standards of housing, health and sanitation, and adult education must be raised...The program the mission has in mind calls for the progressive introduction of rural community workers into the villages. His training should be primarily agricultural. The knowledge of the community worker need not be profound...In many respects he would be an intermediary between the villagers and the government services which can assist them. (96-97).

The conception of the agricultural engineers as rural development workers acting as an ally of rural populations in helping to organize the farmers to pressure for services and help them to work themselves for village improvement should be further explored in Syria. But it must be remembered that communication between farmers and agricultural engineers does not yet take place with any regularity or ease. Farmers interviewed appear to define their concerns as those of infrastructure: clinics, schools, lack of drinking water. Agricultural engineers see the problems still as merely a matter of bringing new technologies to local agriculture. The road that needs to be traveled between the two sets of concerns is a long one. The first step is to open the communication link between the two and create the action agencies that can effect integrated change in rural life.

ICARDA's approach to the problem is one of increasing the practical competence of the agricultural engineer in general agriculture as a first step. Their training moves away from the theoretical approach to the mechanics of seed bed preparation, machinery usage and so on. It is felt that as the engineers' competence is increased in this area, confidence will also increase, they will be willing to interact more often with farmers. It is too early to judge their success, but the idea appears to have merit.

Another step might be to improve the practical content of the general agricultural education received by most engineers and to provide in-service training to those in the field. This would call for farmer and ministerial support in university curriculum development, equipment purchase and instructors in the initial phase of the program. In-service training for engineers already graduated would require a revitalization of that section of the Extension Directorate, the development of a curriculum, purchase of support infrastructure and training of a staff. All of these would require outside support.



It would be hoped that both of these programs would utilize an initial methodology similar to that described for ICARDA's field trials which would:

1. Encourage the engineer to look at the sociological and economic characteristics of the community in which he works and utilize these in evaluating participation of farmers;
2. Encourage the engineer to experiment with local variations to determine which seeds and input mix best suit local needs;
3. Use these experiments as a means for contracting farmers and getting their ideas on needed technological changes, in addition to merely demonstrating new techniques. The newly developed techniques themselves could be made more relevant to the farmers' needs through this mutual interaction. More important, however, is that the engineer would have a more systematic approach toward understanding the farmers' needs, while the farmers could learn something about the scientific approach toward problems.

The ICARDA techniques represent a first step. It is an improvement over the rather non-directed approach which appears to exist today. Although agricultural engineers satisfy the quotas of work set in the programs, it is evident that they often have little interest in their work. The alternative approach suggested by ICARDA begins to point the way toward goals that would attract college-trained individuals toward occupations of national service and motivate them to work with farmers once they enter government service.

Taking the next step, from rural agricultural concerns to one of community development would require national support of a new type. Institutions like the MAAR would not be sufficient on a local level to provide all of the services necessary for this approach. What is needed is to integrate services at higher levels in rural communities and use the community worker to extend those services in the villages themselves.

There are organizations already in existence which provide some of these features. These are:

Social Welfare Centers: Which provide multiple services within rural areas. Although the program is limited, it shows that coordination between ministries can take place for the purpose of local delivery of services.

Cooperatives: Provide a means for organizing farmers at a level beyond their family concerns and traditional alliances.<sup>12</sup>

Peasant's Union: Represents the interests of some farmers, acting sometimes as advocates for their interests in improving the quality of rural life.

Fruit Tree Production Project: Coordinates both training and supply, incentives and planning to produce a large-scale attempt at increasing fruit production within Syria. This program shows how coordination can be utilized to satisfy limited uniform goals.

Ministry of the Euphrates: Shows how services can be integrated and coordinated on the basis of geography to serve local concerns. There is no reason why this geographic approach toward integration could not be repeated, even within smaller localities.

Each of these provide models for a larger integration of services which could in turn provide the institutional support necessary for the local-level community worker. The ICARDA model would be used merely as a bridge between old and the new, helping the agricultural engineer to change his patterns of understanding to suit the new requirements. Institution building and modified training programs would provide new types of personnel to support the engineer as he then takes the next step toward a larger role. This first step requires the opening of farmer-engineer communication and that is where the initial concentration of effort must take place.

Finally, preliminary research into local communities and follow-up studies on the effects of government activities cannot merely be tacked onto existing bureaucracies. These procedures must be an integral part of all planning procedures. This is not being done in any of the organizations of the SARG with the possible exception of GADEB.

Al-Attar (1975) did a study of radio-listening habits of sugar beet farmers in Damascus Mohafaza, but this sort of research has not been continued in the MAAR. As a consequence, the "Voice of the Farmer" for example, has been broadcast for 15 years at a time when farmers can't listen to it. Research would have shown this fact. It hasn't been done.

Furrow planting of cotton does not work in some soils in the Ghab. Farmers do not utilize the technique in any areas because of this fact. Research would have shown this, and the program or technique could have been modified. It hasn't been done.

An attempt has been made to show how the field engineer can improve his interaction with the farmer. We have also tried to show ways in which the engineer can be utilized in some collection of localized data which can be of use to planners. If the agricultural engineer is used too much for this kind of work, however, he soon will lose efficiency in his regular duties within the community. Every government unit which interacts with communities must have the capacity to comprehend problems within those communities, and each agency must be able to monitor its own effect. The task is massive because it has been done so little in the past.

There is no substitute for basic socio-economic research carried out systematically by trained personnel. Ideally, Syria needs to embark on a program of encouraging social scientists from various

countries to do research as well as to help train students in the techniques of applied research. In order that Syria can benefit from this work, it is recommended that an Institute for Syrian Studies be started in connection with the university to act as a liaison and coordination unit for the carrying out of research on the social organization and other aspects of the lives of groups living within Syria. This program could be a home base, in initial years, for students sent abroad on scholarships and scholars coming from overseas. Eventually, however, it could be a center where most of the necessary basic social research could be carried on by locally trained scientists. The Institute would stress research connected with development problems and could develop a direct connection with the Planning Commission, so that needed information from any locality could be obtained for any special project. At the same time, the Institute could maintain an on-going series of research projects which would add to the public's knowledge about the living traditions within Syria, through scholarly and semi-popular publications.

#### Conclusions:

It has been necessary to explore a large number of institutions to carry out this analysis of the agricultural information system in the SAR. It is the purpose of this final section to summarize these observations and offer some recommendations to the government for:

#### 1. Location of Agricultural Engineers Serving Extension Functions.

Field level agricultural engineers should continue to serve as often as possible in their own home areas, especially in areas where there is relative ethnic homogeneity. The advantage of utilizing a member of a community as an "extension agent" to overcome the natural reticence of some communities toward contacts with the outside far outweighs the disadvantages of that practice. In heterogeneous areas, however, means would have to be found to assure normal interaction between engineers and other communities of which they are not a part.

#### 2. Preparation and Training of Field Personnel.

The training of agricultural engineers needs to be significantly re-oriented toward stressing the practical aspects of agriculture. Having practical experience will increase the engineers' competence in the field and in turn raise their confidence, thus increasing their ability for interaction with farmers. Increased interaction between farmers and engineers (and their staffs) improves the climate for communication which in turn improves the climate for development.

Interviews with field personnel of the MAAR indicate that they are operating with one-third to one-half the number of agricultural engineers necessary for present programs. It is therefore recommended that the number of engineers and supporting personnel be increased.



However, program effectiveness is not merely a question of numbers. Rather, the training of existing engineers needs to be improved, with the number of new engineers being slowly increased as new and useful slots can be opened for them.

### 3. Field Contacts with Farmers.

Programs such as the old (pre-1968) extension service, ICARDA, the Fruit Tree Production Program, the Tobacco Monopoly Program and programs in the Ghab have been successful partially as a result of their high degree of contact with farmers. Any extension program must follow these examples if it is to be successful. Personal communication, demonstrations and interaction have been shown within the Syrian context to be highly effective as a means of information exchange. Pamphlets, films, broadcasts, etc. can inform the farmer, but personal contact with trusted innovators and village leaders is a minimum necessity for actual changes in farming techniques to take place. The practice of having agricultural engineers and technicians serve in their own communities coupled with improved training of those engineers would increase the trustworthiness of these individuals. Stress in extension must continue to be laid at the field level rather than on a sophisticated media-oriented directorate.

### 4. Use of Multiple Communication Channels within the MAAR and with Farmers.

The executive level offices of the MAAR are apparently overutilized for transmitting agricultural information between levels and between departments in the agricultural sphere. There tends to exist serious communication overload at certain administrative points in the system. More channels of communication must be established between different levels of special purpose directorates within the MAAR and offices outside the MAAR must establish their own parallel linkages to farmers. These will both increase the chances of messages getting through and permit organizations to monitor their own effects by increasing two-way communication.

### 5. Decentralization and Adaptation of Programs.

Although the independence of the Agricultural Director at the Mohafaza level indicates a potential for decentralization of agricultural programming, our analyses of the licencing procedure, the extension directorate and other special programs of the MAAR show a heavy reliance on centrally planned programs and input recommendations which often do not sufficiently take into account local conditions. Local geographic conditions must be used to modify even the best centrally planned programs if such programs are to succeed on the local level.



6. Extension as a Specialized Function.

The recent decision to create a special organization for extension within the MAAR is to be highly commended.<sup>13</sup> Attempts by special purpose organizations to organize their own extension services have failed to achieve significant results, at least in part because they necessitate great manpower requirements and they lower the efficiency of specialists in delivering services by giving them higher workloads not specifically relevant to their talents. Properly organized, an "extension service" could take localized problems into account, while concentrating on the specialized problem of information exchange. Other organizations could continue to communicate information to farmers in their commodity areas, but such communication delivery should be coordinated with the extension program of the MAAR.

7. Farmer Cooperatives within an Extension Strategy.

The multiplicity of channels for information exchange between farmers and technicians should be stressed in training as well as communication within and between departments (number 4 above). Thus in addition to the "extension service" of the MAAR, it is recommended that the extension and communication functions of the peasant's co-operatives should be improved. This is not to say that the Peasant's Union or cooperatives should be the sole source of technical information. The cooperatives, as we have shown, have a limited clientele and thus too much emphasis on extension delivery by these cooperatives would leave a great many farmers without a source of this necessary data. At the same time, farmers within the cooperative system find the Peasant's Union a credible source and an extension program would complement its other services. The Peasant's Union indicated that its training and extension programs would have to be greatly improved, especially in agricultural information content, before this could successfully take place.

8. Extension Coordinated with other MAAR Functions.

Combinations of regulation enforcement, extension and incentives seem to be the fastest means utilized in inducing change in agriculture. This has been demonstrated in both the Fruit Tree Production Project and in the Tobacco Monopoly's plastic tunnel program for seedlings.

9. Socio-Economic Research and Planning.

Although it would be inappropriate for this report to assess the reasons for success or failure for the GADEB, it appears that both the Euphrates Project and to a certain extent the Ghab Project have attempted to use socio-economic research into farming systems as a component of their planning process with feedback at every stage of growth concerning the effects of their programs. This kind of practice needs to be encouraged in other projects as well, both in planning and in monitoring the effects of projects. This can also be increased by encouraging socio-economic research programs in the universities and linking the gathering of data to the planning process.

Notes

1. A certain percentage of the number of registered engineers are presently in the Syrian armed forces under compulsory military service. It was impossible to determine the exact total, although estimates range from 1/3 to as high as 1/2 of the 1977 total. This should be taken into account in manpower estimates, but the effects are hard to assess.

2. I am told that the name "agricultural engineer" was invented to lend glamour to an otherwise unattractive position. There is no equivalent to this title in American agriculture.

3. There are exceptions to the rule that one is hired in his own Mohafaza, but these exceptions generally involve special purpose ministries, such as the Euphrates Ministry or offices outside of the MAAR. As one moves up the ladder, however, one is more likely to be assigned to a post in an area outside of one's own Mohafaza. This makes some engineers reluctant to strive for promotion.

4. An agricultural engineer is paid more to work outside of Damascus and other urban areas, generally 100-300 pounds more depending on level of experience and the degree of hardship encountered in the region. Some engineers would like to be promoted back to Damascus because of the attractions of life in the city, but literally cannot afford it; even with a promotion, moving to the city with its higher living costs would mean a net loss of income.

5. "Stabilization area" (or region) is a term used to define land use by the amount of rainfall. The primary use of land classification of this kind is to limit the kinds of production allowed in certain areas. Land type is taken into account, then, in the fertilizer licencing procedures. Stabilization areas are defined in the Statistical Abstract as follows:

First Stability Region: Annual rainfall is over 350 mm. and not less than 300 mm. in two-thirds of the considered years.

Second Stability Region: Rainfall rate ranges between 25-300 mm. and not less than 250 mm. in two-thirds of the considered years.

Third Stability Region: Rainfall rate is over 250 mm. and not less than this rate at the mid-considered years.

Fourth Stability Region: (Marginal) rainfall rate ranges between 200-250 mm. and not less than 200 mm. in 150 of the considered years.

Fifth Stability Region: Other lands not considered above.

6. "It has been mentioned that as much as 50 percent was charged in 1952 for loans granted in cotton cultivation" (UN/FAO, 1969:197).

7. "Alawi peasants of the Ghab region forced the government in 1969 to end a system of obtaining supplies from small entrepreneurs in Hama--a system that greatly indebted them to the Agricultural Bank in order to pay their debts to the businessmen. The government suppressed the uprising with force, but instituted cooperatives to correct the abuse" (Galvani, 1974:10).

8. One explanation for this double bureaucracy was that the Organization for the Exploitation of the Ghab was once independently financed. At that time, both agencies had separate staffs and only the Directorate was part of the MAAR. Today both are part of a single MAAR budget and financial constraints have caused them to trim their staffs.

9. At one time there was a cooperative directorate as well within this system; now, however, the cooperatives are run directly by the Peasant's Union in the area.

10. In addition to the Ministry of the Euphrates, there is also a MAAR Agricultural Directorate in Al-Rakka Mohafaza. This is run like all other Directorates and serves farmers outside of the Euphrates project area, but within the Mohafaza.

11. Very few agricultural engineers are employed by the Tobacco Monopoly. This is due to the fact that apparently a lot of hiring was done before many agricultural engineers were commonly available. The staff appears to be stable, remaining in their jobs for long periods. In spite of their lower qualifications, the "professional and technical" staff is said to be experienced and quite adequate for the job. When asked how these lesser-trained individuals handle plant protection problems, one official said, "The diseases of tobacco are well known and our plant protection man has been doing his job for many years. He doesn't have any degrees, but the job is pretty routine." The Tobacco Monopoly appears to be an independent kingdom, sealed off from the rest of the agriculture in Syria.

12. See Shawki Barghouti, 1976, for a discussion of the role of cooperatives in improving communications flow within agricultural areas.

13. See Appendix 1 for a copy of the legislation to reorganize the Extension Directorate. Here there is provision for monitoring of effects, but it is a separate office merely tacked on to an existing one. Ideally, every group should be monitoring its own effects and be reevaluating its activities accordingly.



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APPENDIX I: Text of Resolution Reorganizing The Extension  
Section of the Ministry of Agriculture  
and Agrarian Reform

(Unofficial Translation)  
Syrian Arab Republic  
Ministry of Agriculture and Agrarian Reform

Resolution No. 210/T

Minister of Agriculture and Agrarian Reform  
On the basis of the regulations of Decree No. 2590  
dated 1968 especially those of article 9,  
On the basis of the regulations of Resolution No. 75/T  
dated 1974  
On the basis of the regulations of Resolution No. 32/T  
dated 1972 and its amendments, and  
according to the approval of the Presidency of the Ministers  
Council No. 12698/1 dated 7/12/1978 and in compliance with  
the commonweal requirements,

Resolves the following:

- Article 1: A department called "Department of Agricultural Extension" is to be created in the Ministry of Agriculture and Agrarian Reform, in addition to the other departments defined by Resolution No. 32/T dated 6/4/1972.
- Article 2: The Department of Extension innovated by Article 1 of this Resolution carries out the following tasks:
- a) to become acquainted with the barriers to increased production and development in the agricultural sector and through cooperation with the specialized departments, especially the Department of Agricultural Research and other departments working in agricultural research and the farmers organizations so as to find suitable solutions.
  - b) Field participation through the launching of extension programs to qualify and prepare farmers to apply the plan of production and make use of the agricultural services rendered by the Ministry of Agriculture and Agrarian Reform and the other departments subject to it.
  - c) Cooperation with the departments of agricultural research in order to put the results of research into practice using all available means.
  - d) Cooperation with the departments responsible for monetary and corporeal financing, and with those responsible for securing the agricultural requirements and machines, so as to acquaint farmers with the ways of getting these requirements and machines and using them.

- e) Cooperation with the departments responsible for marketing the agricultural products as a means of acquainting farmers with the best ways and means of marketing their products and gaining the highest profits with the lowest costs.
- f) Participation with farmers organizations in choosing the pioneer individual and collective models of farming which are to be centers of radiating guidance for others.
- g) Working to transmit experiences and to introduce agricultural methods by establishing demonstration fields and trial plots, and by issuing magazines, pamphlets, posters, films, pictures and other means besides the participation in radio and television programs, organizing exhibitions, production competitions, symposia and through other ways and means of public communication according to principles and programs made for this purpose.
- h) Launching general and specific courses for those who work in the field of agricultural extension in cooperation with the concerned departments according to plans laid out for this purpose.
- i) Working to achieve integration and systematic arrangement in the field of agricultural extension on all levels with government associations, institutions, and organizations concerned with agriculture and the improvement of production.
- j) Participation in preparing applied programs that go with priorities of solving existing agricultural problems and their effect on the development of agricultural production.
- k) Proposing exploitation programs, projects and plans that will carry out this purpose aimed at supporting the quality and quantity of work prevailing in agricultural extension.

Article 3: The Department of Agricultural Extension will consist of the following sections and administrations:

- a) Field extension section consisting of the following administrations:
  - 1. administration of extensional units
  - 2. administration of fields
  - 3. administration of field days and symposia.
- b) Section of agricultural information, consisting of the following administrations:
  - 1. administration of audio-visual aids
  - 2. administration of publications
  - 3. administration of exhibitions and festivals
  - 4. administration of museums.

- c) Section of extension training, consisting of the following administrations:
  - 1. administration for training the extension system (staff) and
  - 2. administration for training farmers.
- d) Section of interior supervision and follow-up, consisting of the following branches:
  - 1. branch of evaluation and follow-up,
  - 2. branch of programs, and
  - 3. the office branch.

Article 4: An association called "The Association of Agricultural Extension" is to be innovated in every Mohafaza. It consists of the following administrations:

- a) administration of field extension, and
- b) administration of agricultural information.

Article 5: Units of extension are to be innovated in all Mohafazat in accordance with the requirements for carrying out the production plan and those of the agricultural services which execute this plan, and in accordance with the available potentialities.

Article 6: All regulations which contradict this Resolution are hereby abolished.

Article 7: This resolution is to be published and communicated to whom it may concern for execution.

Damascus: 27/12/1978

Minister of Agriculture and  
Agrarian Reform  
Engineer Ahmad Kabalan

Copies-----

(listing follows)



## APPENDIX II:

### The New Extension Mandate

#### A. The Definition of Extension

According to the Symposium in Agriculture held in Damascus in 1977, extension is defined as

an informal educational system that does not adopt the academic methods of a school in communicating information but rather that uses all possible means which will urge people to help themselves by learning things that they need to learn. It is, in other words, a constant educational process that depends for its development on progress in scientific research as well as in social progress, which fact makes of agricultural extension an active system that is meant to serve the objectives of development (Prime Minister's Office, 1977:64).

Those assigned to oversee the establishment of such a system in the SAR noted that responsibility for extension was given to the cooperatives and the State farms in the period after 1968 while the role of the MAAR was greatly diminished in this area. According to one point of view, the cooperatives and State farms failed as vehicles for training farmers in new, economically sound techniques and were unable to provide "pioneer models" which caused these enterprises to lag behind the private sector. By 1975, the agricultural sector produced only 18 percent of the national income compared to 34 percent in the late 1960s. One of the reasons for this lag was the inability of the public sector to convince farmers to utilize new techniques.

Proponents of this argument called for a re-evaluation of past policies and for an expansion once again of the role of the MAAR in extension activities. The goals of this extension activity would be to achieve the highest return on and improve agricultural production within the present economic framework (i.e., without overly rapid evolution toward collective forms of production). This concentration of extension would be shifted from the public to the private sector in the hopes of providing new models for private peasants who control 65 percent of the agricultural resources in the SAR. This policy emphasizes improvement in "what is" before pushing for "more advanced economic models." Also, the human factor is stressed as the major element of the extension process.

The proposal of this policy demonstrates a recognition on the part of members of SARG of the major point of this report, namely that communication needs to be re-established between agricultural policy planners and the farmers of the SAR. The first step in this process is the determination and recognition of existing conditions.

This implies travel to the field, research and, most importantly, interaction. The new policy stresses gaining the trust of the peasant. This can only be achieved after communication is established and will only be assured when the agricultural engineer is certain of his own ground and has useful knowledge to impart. This too is recognized in the new policy which discusses the need for strengthening agricultural programming. At the same time, the preference for cooperative production remains, but the primary goal is to increase agricultural production and not actively block any production form.

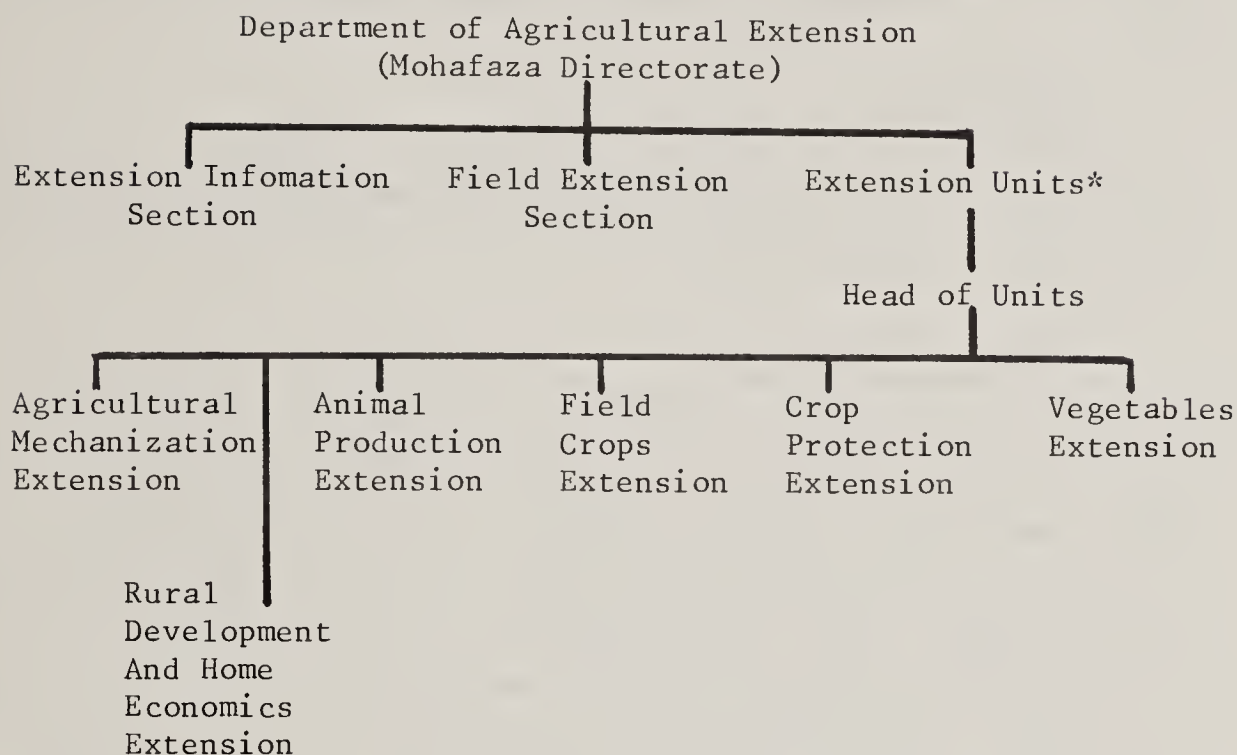
This is to be accomplished by emphasizing the following in extension programming:

1. Regrouping of cropped land for improved mechanization
2. Improvement in financing and distribution (and presumably education about this area)
3. Improvement in fertilizer usage and estimation of fertilizer needs
4. Increased crop protection
5. Improved programs in crop intensification and rotation
6. Improved irrigation methods
7. improved drainage methods
8. acquainting farmers with new organizations related to agriculture
9. rural development and home economics.

Crop production extension programs would stress wheat, barley, yellow and white corn, cotton, fodder plants and legumes, sugar beet, potatoes, fruit trees and vegetables, as well as animal production. Fishing and beekeeping would also be emphasized.

This program is to be organized to promote flexibility in that it can be expanded to add new personnel as they become available. The role of the extension organization at first is limited to training, programming, evaluation and supplying of supplementary media items. Field extension at the provincial level (Mohafaza) will be part of the immediate program. Regional (Mantika) efforts will be added as capabilities increase (after the next five year period). The national level structure is the one listed in Annex 1 to this report. At the provincial level the structure is as follows:

Proposed Mohafaza-Level Extension  
Program Organization, 1979-1983



\*Each unit with 5 technicians, plant protection specialist mechanic, training worker, fruit tree worker, husbandry worker, crop protection worker and driver.

---

B. Problems in the Proposed Framework for Extension, 1979-1983

Although the program envisioned has been greatly increased in scope and size, it represents no real change from policies tried earlier and discussed above. The new program, for example, engages extension at the wrong level. The structure of the new program stresses programming at the national and provincial levels where the tendencies always are to stress office work at the expense of field level work. Contacts with farmers will probably be minimal, thus making it difficult for extension agents either to affect farmer's behavior or learn about conditions. The programming of extension is still conceived of on a national level rather than reflecting local farmer needs. Knowledge is still something to be "deposited" and no interaction is envisioned. This is further stressed by the emphasis put on cinema, publications and other "packaged" information sources. These minimize actual contact time with farmers and reflect conditions which may not be specific to his problems. This type of presentation again reflects a bias toward an educational outlook which merely deposits information and does not develop capabilities.



Although the goals of this new program are worthy of being enacted, the actual program falls short of being able to deliver these goals. Establishing more localized regional programs only after five years could be a serious error, for it would establish a new office separate from the farmers, unaware of local needs and unable to respond.

### C. Recommendations

The increase in the size of the extension program is to be lauded and the goals cannot be argued with. Are the means for achieving those goals adequate and is the philosophy behind farmer-technician interaction a productive one?

Elsewhere in this discussion I stress the need for increased interaction between farmers and the ministerial offices assigned to support them. I stress the need for a period of learning, of research into the needs of the village, of improving the agricultural engineer's grasp of practical agriculture and of increasing the farmers familiarity with the engineers. The specialization of extension into service functions (crop protection, animal husbandry, etc.); even for educational purposes, is a costly duplication. The extension agent, as we have pointed out, is best utilized to begin the interaction between farmers and government, to begin the process of tailoring the delivery of agricultural (and social) services to local needs. For this reason the priorities should be reversed. The extension agents should be placed at the field level (below the province) in the initial five-year period, utilizing existing specialists at the provincial level (crop protection, husbandry, etc.) as resource personnel. The agent must stress interactional modes (field days, test plots, on-farm experiments, etc.) both to involve the farmer and increase the knowledge of province level agricultural workers about local needs and conditions. His findings need to be presented, formally, to these workers as well. In essence, the agent becomes a go-between. For this reason, the agent must abandon, for the most part, films and other pre-packaged forms and begin to find answers to specific problems discovered in the course of his own familiarization with his assigned area. These answers come from other farmers, from the MAAR office, from publications, from the agent's own experience and from the University. The agent must be seen as the person with literacy, time, (hopefully) transportation and access to all areas where answers can be sought.

Resources in an extension program should be placed to maximize his contacts with farmers, specialized personnel and university personnel. He must therefore live in the field, but have access to reliable transport. He must be interested in local problems, rather than attempting to satisfy vague national goals. He must have support from above, but this support should be administrative and aimed at facilitating his access to specialist's information.



Given this point of view, and the established goals, stress should be local. Given limitations in personnel, it would be more effective to begin with a localized program in some areas, than have a province level program with offices covering all areas.



CHAPTER XI

AGRICULTURAL EDUCATION

By

Theodore Shannon and J. David Stanfield

TABLE OF CONTENTS

	<u>Page</u>
1. Role and Function of Education in Syria	2
Independence and Educational Growth	3
Popular Democratic Goals	3
Secondary Schools Level	4
Agricultural Educational Institutions	5
2. Secondary Schools of Agriculture	5
Curriculum	6
Students	7
Staff	8
Veterinary and Agricultural Machinery High Schools	9
Placement of Graduates	9
3. Post-Secondary Intermediate Institutes	14
Intermediate Institute of Agriculture in Aleppo	15
Intermediate Institute of Agriculture in Lattakia	17
Intermediate Institute of Agriculture in Damascus	18
Intermediate Institute of Land Reclamation in Rakka	20
Intermediate Institute of Farm Machinery in Aleppo	22
4. University-Level Agricultural Education	24
Goals of the Faculties of Agriculture	24
Admissions and Student Support Policies	26
Faculty Resources and Responsibilities	28
Curriculum	31

(Continued)

Post-Graduate Programs and Research in the Faculties of Agriculture	33
University Extension	33
Capacities of the Faculty of Agriculture at the University of Aleppo	34
The Faculty of Agriculture at Deir-ez-zor	36
The University of Damascus Faculty of Agriculture	36
The Faculty of Agriculture at Teshrine University in Lattakia	37
Problems of the Universities' Faculties of Agriculture	39
5. Summary and Conclusions	42



## 1. Role and Function of Education in Syria

Examination of recent Syrian history reveals an extensive faith in popular education. Since independence very substantial resources have been allocated to education by Syrian authorities both to create and maintain a national system of education (pre-primary to university) and to extend educational opportunities to all segments of society.

This high value given to education contrasts sharply with the pervasive neglect of education during previous historical periods. During the four centuries of Turkish domination, minimal educational opportunities, as were available then, were limited to sons of civil servants and notables. Education was rudimentary, normally religious, or military, in nature. The language of instruction was Turkish. A static government monitored a static society. Accordingly, the aim of education was conservative: to maintain the status quo.

Toward the end of the Ottoman period a network of private religious missionary schools emerged. Conservative educational aims characterized these educational institutions also, intended as they were to serve foreign--not Syrian--interests. These schools also were available only to a select few.

The period of the French mandate following Turkish defeat in WWI continued the restriction of educational opportunities to children of high officials of the upper class. Schools maintained and supported the French-imposed status quo. Characteristically, recognition was given only to French diplomas.

A tight system of competitive examinations was designed to restrict--not enlarge--educational opportunities. Schools contributed little to open-ended social mobility, channeling their graduates instead toward objectives which supported the occupying power.

The curriculum of the schools was elitist, eschewing the vocational and technical subjects appropriate to the working populace at large. It concentrated instead on the general, literary, and cultural subjects believed to provide a more ideal preparation for the few who would inherit positions of authority and influence, or lead lives of leisure and privilege, or, alternatively, advance to the universities of France.

There were, to be sure, occasional eruptions of Arab nationalistic sentiments. These aimed at educational reforms in keeping with indigenous needs and aspirations. But progress toward these goals were only partial and uneven before the military struggle which led to independence from French domination.

### 1.1 Independence and Educational Growth

Great educational strides have been taken in the three decades following independence. Education was assigned a central role in national development. A unified multi-level educational system was created. Educational enfranchisement was enlarged and extended to all age groups. Beginning education for the young was made compulsory. Nation-wide literacy became a major goal.

In spite of handicaps and a serious need for further improvement, the Syrian record of educational achievement is impressive. There now are three universities, one university-level higher institute, and approximately 25 two-year intermediate postsecondary institutes. In addition, there are over 60 other institutes and training schools, some of which function at a postsecondary level, and others offer adult education, literacy, or specialized training programs. In comparison to 736 students enrolled in universities in 1944-45, there were over 65,000 in 1975-76, and an estimated 94,000 in 1976-77. In addition, in 1974-75 nearly 30,000 students were enrolled in higher education programs abroad. In the same year, there were 6,530 primary schools with 1,160,088 pupils, compared to 1,072 schools and 148,428 pupils in 1944-45. Similar figures for intermediate and secondary schools show only 64 schools and 11,592 students in 1944-45, compared to 1,022 schools and 415,816 students in 1974-75. These remarkable accomplishments were achieved in spite of political and military interruptions; the internal political stability in the 70s enable consistent policies to be put into effect. In studying this record it is well to keep in mind that Syria remains in large part an agricultural, not industrial, nation.

### 1.2 Popular Democratic Goals

National purposes shape educational systems and determine educational goals. It is not accidental that the stagnant Ottoman occupation neither required nor tolerated much educational activity. A stable and illiterate peasantry was not out of keeping with the purposes of the occupiers.

The French attitude was only slightly more enlightened toward occupied Syria. National educational institutions were sparse, and those few reflected French purposes. French, not Arabic, language and culture, were de rigueur. Access was limited to special socio-economic classes. The curriculum was elitist and non-functional.

After independence, however, the aims of the Syrian Arab Republic veered toward the popular and democratic. Participation, innovation and development characterized the new aims:

"To stabilize the Experiment of the regional administration and continuously develop it in order to achieve the realization of the principle of popular democracy, central democracy and popular participation in the erection of the unified Arab socialist society." (4th Five-Year Plan, p.5)

The educational aims of the new Syria are consonant with these larger purposes. The SAR Constitution of 1973 states:

- Article 21: The educational and cultural system shall aim to bring up a national Arab generation, who are socialist and scientific in their manner of thinking, attached to their land and history, proud of their heritage, and imbued with the spirit of struggling to realize the aims of the nation of Unity, Liberty, and Socialism, and of contributing to the service and progress of humanity.
- Article 22: The educational system shall ensure the continued progress of the people and shall meet their continued social, economic and cultural development.
- Article 37: Education shall be a right guaranteed by the State. It shall be free in all stages and compulsory in the elementary stage. The State shall endeavor to make other stages compulsory, and shall supervise education and direct it in a manner ensuring adapting it to the needs of society and production.

Democratization of schools was emphasized and now proceeded apace. The quantitative expansion in schools and teachers has already been cited. Accessibility has been guaranteed to all citizens: the primary level of education is compulsory for the young. At all levels of education, the costs are in the main borne by the State.

Qualitative democratic changes have also been effected. The curriculum has been enlarged to include the needs of all the people in their various occupations not just the general and literary courses designated for a limited elite. The curriculum of the educational institutions now includes the more practical and vocational, commercial, agricultural and industrial topics appropriate to all socio-economic classes. Special secondary schools and systems of schools were created for training in vocational fields including commerce, industry, health, agriculture and others.

### 1.3 Secondary Schools Level

Secondary education in Syria proceeds on two separate tracks, one for General Education and one for technical education. Access to either track requires a preparatory certificate. Several ministries operate programs at this secondary level, but the Ministry of Education (MOE) is by far the predominant agency in terms of schools, enrollments, outputs and overall influence. It has, for example, sole jurisdiction over the schools of General Education, which account for the largest numbers of secondary pupils.



1.3.1 General Education: General Education is divided into two branches, a literary branch and a scientific branch, each with its own two-year course of study following a general introductory 1st year which is common to both. As their titles suggest, the literary branch lays stress on studies in the humanities, in contrast to a scientific and mathematical curriculum emphasized in the latter.

The primary function of the General Secondary track is to prepare students for entrance to the universities. It is widely believed by Syrian authorities, and others, that General Education is still over-emphasized and that a greater number of technical graduates are needed to fill national manpower needs. One major aim of the third Five-Year Plan (1971-75), for example, was to raise the number of students admitted to the technical schools to one-half the number entering the general secondary schools.

1.3.2 Technical Education and Vocational Training: Seven ministries operate separate secondary schools for technical education and vocational training, but in this sector, too, the MOE has jurisdiction over the greatest number. With 24 industrial and commercial secondary schools the MOE produces about 8,500 graduates annually. Together the remaining six ministries produce, in their 38 schools combined, less than 1,700 graduates in the fields of agriculture, health, industry, commerce, and transportation.

Those institutions dealing with education and training in the field of agriculture are dealt with in the following pages.

#### 1.4 Agricultural Educational Institutions

Formal agricultural education takes place in three types of institutions operating at distinct educational levels: a secondary level of vocational schools for training skilled and semi-skilled workers; a post-secondary two-year intermediate level for paraprofessionals and technician training; and higher education, at the university level, designed for the preparation of agricultural professionals.

### 2. Secondary Schools of Agriculture

The MAAR is the agency responsible for providing training in agriculture at the secondary level. Toward this end it operates six agricultural schools, one technical veterinary school and one farm machinery school (See Tables 1 and 3). Three new schools are in the process of being established, one a farm machinery school in Aleppo and the other two being technical veterinary schools in Hama and in Deir-ez-zor.



## 2.1 Curriculum

The curriculum of these six schools is divided into three categories, the first being general cultural education (language, religion, physical and military education and national culture), the second containing the basic sciences (mathematics, chemistry, physics and biology) and the third the core technical courses. Table 2 lists these courses and the amount of time ideally spent in lecture and laboratories for each course. The curriculum is quite extensive and should produce good technical graduates. However, one possible difficulty might arise in the case that most of the graduates are to be field personnel, namely that very little training is given either in extension work or cooperatives, especially on the practical problems involved in working with farmers and farmer organizations.

In part, this lack of practical experience is offset by the fact that the students accepted into these schools have to be from a farm family or a farm worker's family. Other requirements for entrance include a certificate of having completed middle school, being between 15 and 20 years old, and having parental permission. The program, however, seems more like a general theoretical survey of agriculture than a curriculum designed to prepare for practical skilled work in the field. The number of different courses taught each year seems excessive. Consolidation, regrouping and pruning of courses seem to be in order.

At the same time this may represent the best program possible given the limited resources provided to the system. It is generally known that the schools lack the proper equipment, laboratories, farm and shop facilities and teaching aids necessary to establish and maintain a better teaching balance between theory and practice. Reconstruction of the curriculum would be enhanced by feed back from a working follow-up system with input from graduates and employers alike.

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TABLE 1: The Six Agricultural High Schools

Location	Year				Total
	Founded	Year 1	Year 2	Year 3	
Salamiah	1910	102	16	42	160
Lattakia	1947	62	31	37	130
Deir-ez-zor	1948	132	78	56	266
Dar'a	1960	22	0	13	35
Aleppo	1970	141	81	51	273
Harem	1970	45	47	43	135
TOTAL		504	253	242	999

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TABLE 2: Curriculum of Secondary Agricultural Schools

Course	College Hours					
	1st Year		2nd Year		3rd Year	
	Lec.	Lab.	Lec.	Lab.	Lec.	Lab.
<u>National Education:</u>						
Arabic	1	0	1	0	1	0
Religion	1	0	1	0	1	0
Foreign Language	2	0	2	0	2	0
National Culture	1	0	1	0	1	0
Physical Education	0	1	0	1	0	1
Military Education	1	1	1	1	1	1
<u>Basic Sciences:</u>						
Mathematics	1	0	1	0	1	0
Chemistry	1	1	1	1	1	1
Physics	1	2	0	0	0	0
Biology	1	2	1	2	0	0
<u>Technical:</u>						
Animal Husbandry	1	1	1	2	1	2
Poultry	1	1	1	1	1	1
Bees & Silk	1	1	0	0	0	0
Horticulture	1	1	1	1	1	2
Vegetables	1	1	1	1	1	2
Field Crops and Climate	1	2	1	2	1	2
Forest and Ornamental Crops	1	1	1	1	0	0
Agricultural Machines	1	2	1	1	2	2
Entomology	0	0	1	1	1	3
Soils (drainage, fertility)	1	2	1	1	0	0
Land Surveys	0	0	1	1	0	0
Extension	0	0	0	0	1	0
Cooperatives	1	0	1	0	1	0
Dairy and Food Processing	0	0	1	1	1	2
Farm Management & Accounting	1	0	1	0	0	0
Agricultural Experiments	0	0	0	0	1	1

## 2.2 Students

One noteworthy feature is that enrollment in the secondary schools of agriculture is, in theory, limited exclusively to children coming from farm families. It was not possible to determine to what extent this limitation is enforced in practice.

At the other end of the secondary system, however, only the top two graduates of these schools may be admitted to a Syrian university. Other graduates, if qualified, may go on to two-year Intermediate Institutes. Children of farmers, like others wishing to pursue university education in Syria, must therefore avoid the

secondary (and the intermediate) schools of agriculture and follow some other track instead.

Students attending the agricultural secondary schools receive a monthly allowance during the entire year including the summer holidays. The cash amount varies depending upon whether dormitories and boarding facilities are provided by the school. The 574 students at Deir-ez-zor, Dar'a and Aleppo who do not receive housing and food from the school they attend receive a monthly stipend of S.£.180. At Lattakia, Salamiah and Harem, however, the 425 students are provided housing and food and receive a monthly stipend of S.£.30 for incidental expenses. The providing of housing or stipend for a substantial number of students helps solve a serious problem facing farm families who want to send their children to high school and have no relatives in town where the school is located or cannot afford the room and board.

### 2.3 Staff

The teaching staff at the six schools is composed of 32 permanent teachers and 49 temporary ones who teach specialized technical courses. Salaries are standard MAAR rates defined for five different levels based on years of experience. The beginning teacher earns a monthly salary of S.£.730, which rises to 835, 1005, 1205 and 1590 for the other four grades. Each teacher is expected to spend 8 months (32 weeks) each year in class and one month in in-service training.

No educational agency has been given special responsibility for preparing the teaching staff required by secondary schools of agriculture, and there is a resultant shortage of qualified personnel. Normally teachers are recruited from among agricultural graduates of the universities. Because all of these agricultural engineers graduate with uniform training as generalists without academic specialties, with little practical experience in agriculture, and without special training or experience in teaching, new recruits are brought in by the ministry for special pre-service training sessions.

Also, each year teachers are required to take a month-long program of inservice training following the close of school, usually in June. These programs are arranged in advance by the school principals in accordance with expressed needs and interests of teachers and the availability of instructional staff. University professors teach in these programs as do technical staff members of the ministry. Some teachers are sent abroad for this in-service training. Instructional costs and the expenses of teachers are carried by the ministry. Teachers in the schools are paid on a 12 month basis and normally have 2 months of vacation with pay following the in-service training period.

## 2.4 Veterinary and Agricultural Machinery High Schools

Besides the six general agricultural high schools, there are two specialized ones, one in the field of Veterinary Medicine in Damascus, and a second dealing with agricultural machinery in Hemo near Kamishly in the mohafaza of Al-Hasakeh.

TABLE 3: Specialized Agricultural Secondary Schools, 1978-79  
(Enrollments)

School	Location	Year				Total
		Founded	Year 1	Year 2	Year 3	
Veterinary	Damascus	1949	74	43	62	180
Ag. Machinery	Hemo	1969	40	28	29	97
TOTAL			114	71	92	277

As in the case of the General Agricultural High Schools, these two schools accept only students from farm families who have a middle school certificate and parental permission. All are accepted who apply and fulfill the requirements. No dormitory facilities are available at either school, so the students receive the stipend of S.£.180 monthly to help defray their living expenses.

The curriculum at the two specialized schools is similar in structure to the General Agricultural High Schools, but with different technical courses so as to give the appropriate specialized training. In the Veterinary School, the third year offers even further specialization, with the students choosing between a focus on animal health, feeding and production and a second dealing more with breeding and laboratory techniques.

The teaching staff at the Veterinary School is composed of four permanent teachers, each with a B.Sc. in general veterinary medicine from the Veterinary Medicine Faculty in Homs. There are 19 temporary teachers who work on a part-time basis and teach the specialized courses in the second and third years of study. The Agricultural Machinery School in Hemo has four permanent teachers also and four part-time teachers for some of the technical courses.

## 2.5 Placement of Graduates

The Ministry of Agriculture does not have responsibility for placing the graduates of the secondary agricultural schools in jobs, and keeps no follow-up records on them. It is assumed, however, that few graduates enter active farming; most find jobs in government or agri-business agencies where the returns are highest. Without feedback about employed graduates, it is not possible to determine the adequacy of training provided them in school, nor the extent to which these schools are meeting national manpower needs. In



terms of basic data about education in Syria, one of the major needs is such a follow-up study of the graduates of the various educational institutions, as we shall see repeatedly in this report.

Table 4 shows the numbers produced by the three types of agricultural vocational high schools since 1951. Since 1976, 225 students have graduated from the Veterinary School, 92 from the Agricultural Machinery School, and 1,097 from the General Agricultural Schools for a total of 1,414 total graduates in the past four years. Years 2 and 3 presently have 658 students enrolled, which will mean that through the year 1980, there will be a total of approximately 2,000 graduates produced during the period covered by the 4th Five-Year Plan.

TABLE 4: Number of Graduates of  
Secondary Ag. Schools

Year	Veterinary	Ag. Machinery	General Agriculture	Total
1951	19	-	28	47
1952	18	-	32	50
1953	14	-	14	28
1954	-	-	20	20
1955	13	-	39	52
1956	15	-	44	59
1957	16	-	43	59
1958	17	-	43	60
1959	15	-	109	124
1960	-	-	145	145
1961	21	-	161	182
1962	18	-	166	184
1963	20	-	297	317
1964	51	-	205	256
1965	21	-	157	178
1966	19	-	53	72
1967	17	-	136	153
1968	30	-	30	60
1969	22	-	11	33
1970	19	-	113	132
1971	27	-	177	204
1972	20	-	377	397
1973	76	32	460	568
1974	37	48	1173	1258
1975	40	34	730	804
1976	99	22	512	633
1977	76	34	415	525
1978	50	36	170	256
TOTAL	790	206	5860	6856

Source: Department of Education: Ministry of Agriculture

As has been indicated, not much is known about what happens to the students who graduate from these schools. The 1970 Census listed a total of 1,298 agricultural secondary school graduates, of which 708 or 54 percent worked in the public sector, 358 (28 percent) worked in agriculture, and the remainder in various other occupations. Many of the graduates go to work for the MAAR. As of January 1, 1978, that Ministry employed a total of 1,256 graduates of the agricultural secondary schools. During the past 10 years, these schools have produced 4000 graduates. Assuming a 10 year work career would imply that approximately 30 percent of the graduates of the past 10 years had found employment permanently with the MAAR.

The MAAR has permanent ("official") and temporary employees. Table 5 shows the number of secondary agricultural school graduates employed in these two categories in the various agencies of the MAAR around the country.

Projecting future employment opportunities for the Secondary Agricultural School graduates is difficult, since so much depends on governmental decisions as to the nature and size of the MAAR's field presence, particularly the size of the new Extension Directorate. One study ("Report on the Feasibility of Livestock Production," German Agency for Technical Cooperation, 1978) estimated that on the basis of one veterinarian assistant for 2,000 livestock units, and assuming a 5 percent annual increase in herds, there would be a shortage of 360 Secondary Veterinary School graduates by 1980. The MAAR itself estimates that it will hire approximately 275 graduates of the Secondary Agricultural Schools by 1980, which is only about 40 percent of the projected number to be graduated by that date, including veterinarian assistants.

Assuming that the new Extension Directorate follows the general plan laid out for the establishment of 156 extension centers over the next ten years, however, it is estimated that approximately 100 additional Agricultural Assistants will be needed by 1980, for a total of 375 graduates of the Secondary Agricultural Schools by 1980 in the MAAR, or about 60 percent of the total number to be graduated. This projected future demand is one reason for the increased first-year enrollments in the secondary schools this past year.

Added to these requirements of the MAAR are the needs of other ministries, particularly the Ministry of Supply and Home Trade and the Ministry of Labor and Social Affairs. The total estimated needs through 1980 of all other ministries is 385 graduates, which yields a total public sector demand of approximately 760, which is approximately 100 people more than will be produced by these schools. The shortage will probably be even greater, however, since a certain number will go into the private sector, which could draw off as much as 40 percent of the graduates if we take the 1970 Census as any indication of private sector demand.

TABLE 5: Positions Held by Agricultural School Graduates in Agriculture Institutions, by Degree and Mohafaza, Official Workers Only, January 1, 1978.

Mohafaza	Secondary	Intermediate	Bachelor's	Master's	Ph.D.	Total
<u>Damascus:</u>						
City Ag. Dept.	1	-	11	-	-	12
Damascus Ag. Dept.	86	15	92	3	1	197
Sidnaya Poultry	2	2	8	-	-	12
Secondary Vet. School	2	-	1	-	-	3
Shami Goat & Cattle Inst.	1	-	2	-	-	3
State Farm	-	-	2	-	-	2
Forage Institute	8	-	30	-	-	38
Poultry Institute	5	-	16	-	-	21
<u>Hama:</u>						
Hama Ag. Dept.	93	14	88	2	-	197
<u>Homs:</u>						
Homs Ag. Dept.	83	18	75	3	4	187
Ghab Ag. Dept.	32	3	34	1	-	70
Poultry Institute	-	-	3	-	-	3
Ghab Investment Institute	-	-	1	-	-	1
Ag. Secondary School	3	-	6	-	-	9
Cattle Institute	3	-	12	-	-	15
<u>Aleppo:</u>						
Aleppo Ag. Dept.	82	2	122	4	3	213
Cattle Institute	-	-	3	-	-	3
Hamadani Institute	-	-	1	-	-	1
Ag. Secondary School	2	-	7	-	-	9
Cotton Office	11	-	19	-	1	31
Seed Multiplication Office	11	1	33	1	4	50
<u>Idleb:</u>						
Idleb Ag. Dept.	91	6	33	1	-	131
Ag. Secondary School	3	-	5	-	-	8
<u>Tartous:</u>						
Tartous Ag. Dept.	125	11	60	2	-	198
<u>Al-Rakka:</u>						
Rakka Ag. Dept.	63	8	42	-	-	113
Al Rashid Farm	-	-	1	-	-	1

(Table 5 Continued)

Mohafaza	Secondary	Intermediate	Bachelor's	Master's	Ph.D.	Total
<u>Lattakia:</u>						
Lattakia Ag. Dept.	83	16	94	2	3	198
Ag. Breeding Inst.	2	-	2	-	-	4
Hurrieh Inst.	1	-	2	-	-	3
Ag. Secondary School	10	-	10	-	-	20
Jableh Fish Inst.	7	-	12	-	-	19
<u>Al-Hasakeh:</u>						
Ag. Institute	89	5	70	-	1	165
Six State Farms	8	-	12	1	-	21
Technical Secondary-Machinery	1	-	3	-	-	4
<u>Deir-ez-zor:</u>						
Ag. Dept.	73	9	46	1	-	129
Ag. Secondary	1	2	17	-	-	20
State Farm	1	-	3	-	-	4
Cow Breeding Inst.	2	-	2	-	-	4
<u>Dar'a:</u>						
Ag. Dept.	67	7	39	1	-	114
Animal Breeding Institute	2	-	2	-	-	4
<u>Sweida:</u>						
Ag. Dept.	54	6	27	-	-	87
<u>Quneitra:</u>						
	22	1	8	-	-	31
<u>Total for Syria, except Central Administration</u>						
	1130	127	1060	22	17	2355
Central Admin.	18	0	159	11	17	205
TOTAL	1148	127	1219	33	34	2560



It is difficult to determine definitely what the policy of the Syrian Government is toward this type of agricultural training. Although plans for new schools are on the boards, or in process of implementation, their numbers are down from previous levels. This is in spite of the government push toward more technical training at the secondary level. The continuing importance of agriculture in the Syrian economy would seem to call for more graduates in technical and vocational fields of agriculture rather than fewer. There is some indication that policy makers are leaning toward enhancing and enlarging the numbers of Intermediate Institutes (see below) in this field rather than the secondary schools. Such a development, should it occur, would distort still further the manpower ratio between professionals and technicians on the one hand and skilled workers on the other.

Perhaps the Intermediate Institutes of Agriculture can supply the shortfall, but it is apparent that the Agricultural Secondary Schools should be given the necessary resources in order to provide the technical field personnel which will be required in governmental programs in the near future.

### 3. Post-Secondary Intermediate Institutes

The two-year Intermediate Institutes occupy a rung on the educational ladder at a level somewhere between the secondary schools and the universities. Their function generally is to offer programs to train substantial numbers of technicians and paraprofessionals. These mid-level workers are in critically short supply in Syria as in other developing economies. Ostensibly the Intermediate Institutes are terminal training schools whose graduates are barred entry to Syrian universities, and whose students may not transfer over to them. The main reason given for making the Institutes terminal in nature is that there is an immediate need for their graduates in the work force. Another justification is that most of their graduates could not qualify for the next higher level of study--which is the university level; indeed one objective in creating the Intermediate Institutes was to accommodate persons with secondary school certificates who could not pass the qualifying examination for university entrance. And finally, Syrian authorities intended in creating these Institutes to divert many students toward them and away from the universities which are over subscribed and in need of relief.

In practice, however, the Intermediate Institutes have neither attracted nor graduated clients in very large numbers, as compared, for example, to the universities. Moreover, some of their enrollees still contrive to transfer to the university track. Many, having failed a first attempt to attain examination grades which would admit them to a university, find it useful, or convenient, to enroll in the Institutes while they prepare for another try at the universities.

Like the secondary schools, the Intermediate Institutes are not part of a single system, nor are they administered by a single ministry. The Ministry of Higher Education controls the greatest number, followed by the Ministries of Education and of Industry. Various other ministries operate the remainder, each of which provides training in line with the needs of its sponsor.

Interestingly, it is the Ministry of Higher Education which is responsible for the Agricultural Institutes. These are closely associated with the universities in terms of location, staff, administration and facilities, but despite their propinquity there does not seem to be much mutuality between them, either of interests or benefits.

Chief among the problems faced by these Institutes are those of financial support, facilities and equipment, and staffing. While in some cases Institutes occupy good facilities, most of them are in neglected cast-off buildings constructed for other uses and no longer needed by the campuses.

In competition with the universities for qualified teaching staff, the Intermediate Institutes come out second best, often needing to employ less qualified personnel on a part-time basis. When they can utilize the temporary service of local professors or technicians from related ministries, the quality of instruction may be enhanced but long-term stability and autonomy of programming suffers accordingly.

All of these features, coupled with the indifferent character of the student body, combine to give the institutes an aura of inferior status, which is apparently emphasized by the difficulties graduates have in securing employment. Ministries often do not have defined slots for such graduates, nor are the ministries' personnel sections clear about the meaning of an Intermediate Institute degree. In many instances, after studying for two year behond the secondary certificate, a graduate from an Intermediate Institute will begin working at the same level as a high school graduate.

The investments in such Institutes has, nonetheless, been substantial and their potential for producing well-trained technicians is great. What follows is a description of the five Intermediate Institutes with agriculturally relevant programs.

### 3.1 Intermediate Institute of Agriculture in Aleppo

The two-year Intermediate Institute of Agriculture at Aleppo, administered through the Ministry of Higher Education, was formed in 1971 and graduates assistant agricultural engineers with specialization in animal production or field crops. The enrollments are nominally quite large, as can be seen from Table 6.

TABLE 6: Enrollments in the Intermediate  
Institute of Agriculture at Aleppo

Class	Year			
	75-76	76-77	77-78	78-79
1.	408	91	360	258
2.	48	114	72	101
TOTAL	465	205	432	359

However, a large number of first-year students are enrolled only, and do not attend classes. These students enroll chiefly to defer their military obligations while they prepare to take the Baccalaureate Examination again for securing entrance to the university. All students with sufficient points on the examination who apply to the Institute are admitted, regardless of their intentions. Of the 258 first-year students this year, only 119 are actually taking courses.

Approximately 50 percent of the participating students are from rural villages, and most of these are able to stay at the university dormitories. No allowances or stipends are given to students enrolled in the Ministry of Higher Education administered institutions. No guarantee of employment exists for the graduates and many have difficulty getting jobs. Approximately 80 percent enter the job market upon graduation, and the rest complete their military obligation or go abroad for their university training.

The curriculum covers general agricultural subjects the first year and allows for specialization during the second. The curriculum is defined by two councils. The first is formed by the Director of the Institute, three faculty, one representative of the Ministry of Agriculture, one representative of private companies and one student representative (the head of the Student Committee). The other committee is formed by all the teaching staff (10 full-time) and the Director and the teaching assistants (eight technical assistants and two which help teach foreign languages). Five of the staff are presently abroad or fulfilling their military obligations. Two new faculty members have been hired this year. Two of the staff have post-graduate degrees and a number also hold positions in the University.

Salary levels vary according to years of service, but the lowest paid staff is given approximately \$190 monthly plus a bonus of 45 percent for being an Agricultural Engineer.



The facilities of the Institute are all shared with the Faculty of Agriculture at the University of Aleppo. New space is being constructed where the Institute will have its own laboratories, classrooms and offices, and is planned for a capacity of 400 students. The laboratories, library, and land are presently shared with the University Agricultural Faculty. A very small library for the Institute is inadequate, since it largely deals with dairy production. Substantial investments in library materials will have to be made when the new facilities are available.

The principal needs of the Institute, aside from space and facilities, concern the training of the staff. The biggest problem the Institute faces as an institution of higher learning is the continuous up-grading of its staff's skills and knowledge.

### 3.2 Intermediate Institute of Agriculture in Lattakia

This two-year Institute, administered by the Ministry of Higher Education, was formed in 1974 and graduates Assistant Engineers with specialization either in tobacco or field crops. The Institute has a physical capacity for about 500 students, but due to a lack of resources, especially of teachers, has had the enrollments since 1974 as shown in Table 7.

TABLE 7: Enrollments in the Intermediate  
Institute of Agriculture at Lattakia

Class	74-75	75-76	76-77	77-78	78-79
1.	61	68	59	92	91
2.		35	44	38	66
TOTAL		103	103	130	157
Graduates		27	41	29	

Students are admitted on the basis of their examination results, and of those who qualified and applied last year, all were accepted. About 40 percent of the present student body are women and the Institute's Director estimates that almost 65 percent of the students are from rural villages in the Lattakia-Tartous area. No housing is provided at the school nor do students receive any stipend.

There is apparently a fairly high attrition rate after the first year, perhaps for reasons similar to the Intermediate Institute in Aleppo, where many students use the first year to prepare to take the Baccalaureate examination again and are able to defer their military service while in the Institute. It should be noted that



the variation in yearly enrollments is less, and attrition in Lattakia is substantially less than in Aleppo. An average of 34 percent (versus 67 percent in Aleppo) drop out between the first and second year. According to the staff, about 70 percent of the graduates find jobs in the public sector, and about 30 percent in the private sector, although no exact data exist on this point.

The teaching staff is composed of two permanent full-time teachers who teach general agricultural subjects, and 14 part-time specialized teachers from various agencies in Lattakia. The teachers possess a great deal of practical experience, but their skill levels depend on what they acquire on their jobs and not from in-service training they might receive, but presently do not, from the Institute. Stress is laid by these teachers on practical experience, which follows from their own practical work orientation. Salary levels depend on years of service in the government, since the decree covering university teaching staff does not apply to the staff of the Intermediate Institutes. Since all teachers are Agricultural Engineers, they are eligible for a 45 percent bonus for working in Lattakia.

The resources which the Institute has access to are relatively good. The building space for offices and classrooms are loaned by the Tobacco Research Center on the outskirts of Lattakia. The laboratories and classrooms have been extensively remodeled and are appropriate for their intended purposes. The land used in the practical portions of the courses is also loaned by the Research Station as is the machinery which the Institute requires. The laboratories are new and well-equipped, better equipped in fact than those of the Faculty of Agriculture at Tishreen University in Lattakia (at least presently, until the Faculty moves into its new space). The library is minimal, and is especially lacking in foreign language materials.

The principal needs of the Institute are (1) buses to get the students from town to the school and from the school grounds to the fields where the practicums are conducted, and (2) specialized in-service training for the instructors.

### 3.3 Intermediate Institute of Agriculture in Damascus

This two-year post-secondary Institute was founded in 1970 and occupies the old campus of the Agricultural Secondary School on land owned by the University of Damascus. The "Assistant Engineer in Agriculture" degree which is granted upon graduation is in either one of two specializations: plant production and animal production.

The students in the present year number 310, of which 154 are first-year students and 156 are in their second year. Approximately 150 students graduate each year. But as in the case of Aleppo, the student body is composed of a mixture of students with very different backgrounds and plans. A total of 289 students registered as first-year students this year, 79 of whom were students forced to repeat

the first year. However, 135 of the 289 first-year students (47 percent) either withdrew or were dismissed because of excessive absences. This phenomenon probably results from the enrollment of students who had other plans after graduation from high school, either to work or to enroll in the university. They apparently had applied to the Institute in case these other plans did not materialize.

Thanks to the efforts of the Institute's Director, a questionnaire was circulated to 105 of the second-year students. This survey gives some additional data on those who are committed to finishing the course work. Of the 105 responding students, 23 were women, all come from non-farm backgrounds, mostly from Damascus. The 82 men students included 8 whose fathers have some land which they farm. Another 17 men students come from areas outside the City of Damascus. A little less than 25 percent of the students came to Damascus only to study, meaning that 75 percent already lived or worked there.

Despite the regulations which prohibit the movement of graduates of the Intermediate Institutes to other institutions of higher learning, about 20 percent of the students mentioned that they were interested in such advanced work, even if it meant taking the High School Examination again or going abroad for a university education. In either case, the students believe that their investment in the Institute will likely not be recognized, or sufficiently rewarded.

Upon graduation, present regulations do not guarantee employment to these students; even so, most do secure employment with the government, or in the private sector. The Director estimated that about 80 percent find work, either in plant or animal production specializations. The demand for such technicians may be somewhat limited, however. Taking only the Ministry of Agriculture, which is presumably where the majority of the Intermediate Institutes' graduates would find work, only 129 such graduates were employed by the MAAR as of January 1, 1978, and only 80 are expected to be hired by December 31, 1980 by all ministries. Undoubtedly, opportunities for such technicians have grown significantly, since in the 1970 Population Census only 72 Intermediate Institute graduates were employed in the whole country.

However, if 80 percent of the graduates end up as governmental employees and if the government plans to hire only 80 Intermediate Institute of Agriculture graduates, this means that in just one year there will be about 200 graduates produced in excess of the demand for their services, approximately 140 of those looking for jobs coming from the Institute in Damascus alone.

Neither the Directors of the Institutes nor the students themselves have a clear idea of what happens to students who graduate from the Institutes. This lack of follow-up information makes it difficult to judge how well the schools are meeting their goals of training people to fit productively into the requirements of the Syrian economy.

The facilities of the Institute are strained. The building which it occupies is shared with the University of Damascus' Faculty of Agriculture, as is the land on which the Institute is located (approximately 20 ha. in the Ghouta area of Damascus). The laboratories are in only fair condition, but four laboratories are in the process of construction. The library is weak and does not have basic reference materials. As is the case of the Intermediate Institutes of Agriculture in Aleppo and Lattakia, the World Bank is considering a loan to help upgrade the physical plant.

As for teaching staff, the Institute has 9 full-time Agricultural Engineers on the staff, three of whom are presently serving in the Armed Forces. Part-time staff include 6 Agricultural Engineers, one Veterinary Doctor, one Law teacher, and two foreign language teachers. Three of the Agricultural Engineers on the staff are presently abroad working on their Ph.D.s. Of the 10 part-time staff, six have other employment in the public sector and teach in the Institute in the afternoons, an arrangement which probably helps make the teaching more practically oriented (at least 50 percent of the course hours are designed to be spent in the laboratory or other practical work in both years).

#### 3.4 Intermediate Institute of Land Reclamation in Al-Rakka

This two-year Institute, which is administered by the Ministry of the Euphrates Dam, was founded in 1974 and produces specialists in (1) Engineering for Land Reclamation, and (2) Agricultural Investment and Social Development. The school has worked in close collaboration with the Euphrates project institutions, especially the GADEB and GOEB, both located administratively in the Rakka area. Up until this year, all graduates have been assured employment in these agencies of the Ministry of the Dam.

Perhaps for this reason, only 40 percent of the applicants were actually admitted last year, since the number of applicants was large and the number of graduates which the Ministry of the Dam can absorb is limited. Sixty percent of the students come from Rakka, Dier-ez-zor and Hasakeh, with the other students coming from other Mohafazat.

In contrast to the three Agricultural Intermediate Institutes administered by the Ministry of Higher Education, the Institute in Rakka can offer a monthly payment of S.£.150 to its students, although no housing is provided. There are 100 first-year and 104 second-year students. Approximately 100 students are programmed for admittance each year.

The Institute's Director asked about half of the second-year students to respond to a questionnaire, which generated some additional information on these students. All of the students responding to the questionnaire were men, which seems to reflect Institute policy. About 64 percent of the students were recent arrivals in the Rakka area, having come there only to study at the Institute. Approximately the same proportion of students come from families which have land which they farm.



One particularly interesting response from these students is the fact that about 75 percent expressed some desire to continue their studies. Perhaps some special opportunities derive from the situation of GADEB which works with international specialists of various types who are helping with the many irrigation and reclamation projects of the Euphrates project. Besides this on-the-job training and the short courses offered by GADEB, these students would have the same difficulties as other students from other Intermediate Institutes in getting any further education in Syria, other than the university, should they take and pass the Baccalaureate Exam and begin their university studies as first-year students.

The students appear to be of similar ages to those in the Intermediate Institute of Agriculture in Damascus; approximately 30 percent are 21 years of age, about 33 percent younger than 21 and 37 percent older. Apparently there is some time lapse for most students between their graduation from high school at age 18 and their entrance into the Intermediate Institutes at age 20.

This Institute has two specializations for the students, one concerning the engineering aspects of land reclamation and the other dealing with the socio-economic development of the reclaimed areas. As in the case of other Institutes, the curriculum is oriented towards different technical subjects, but this one is interesting in that it includes a course of study which is more "development" oriented than technical. A comparison of the two types of curricula shows the difference rather dramatically. This Institute is the only educational institution which offers this Social Development training at the present time in Syria.

The faculty of the Institute come largely from the GADEB and GOEB agencies. There are just two full-time teachers, one in civil engineering and one in agronomy. There are 19 part-time teachers, including 9 civil engineers, 6 agronomists, 2 social scientists, one teacher of economics and one teacher of accounting. Seven laboratory assistants drawn from past graduates were hired this past year. As in the case of the other Intermediate Institutes, these part-time instructors bring to the classroom a great deal of practical experience and help train the students to move more easily into employment than might otherwise be the case. Building a stable faculty and program, however, probably requires more full-time commitments.

A second problem on the part of the teaching staff is the difficulty of getting in-service training and up-dating their knowledge and skills in their various fields of specialization. Working part-time and teaching part-time does not leave much time for keeping in touch with the scientific developments of the various disciplines, particularly concerning the problems of irrigated agriculture.



The physical facilities of the Institute were designed for an agricultural vocational high school of approximately 100 students. The Intermediate Institute now has double that number of students and requires more investment in laboratories and scientific equipment. The Institute presently relies on GADEB facilities for part of their space and equipment needs; also GADEB provides the students with access to the pilot project farms for studying the reclamation projects which have already been completed. To maximize the access to these facilities, which would be prohibitively expensive to reproduce even on a minor scale in the Institute, transportation needs to be acquired to get the students to and from the classrooms with a minimum of time lost.

### 3.5 Intermediate Institute of Farm Machinery in Aleppo

This Intermediate Institute was founded in 1975 and is housed in a Training Center administered through the Ministry of Industry. Its graduates are titled "Assistant Engineers" and are trained in the manufacture of farm machinery. The enrollments since 1975 are shown in Table 8.

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TABLE 8: Enrollment in the Intermediate  
Institute of Farm Machinery in  
Aleppo

Class	1975	75-76	76-77	77-78	78-79
1.	43	111	46	56	49
2.		33	99	42	41
TOTAL	43	144	145	98	90

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Students are admitted on the basis of their Baccalaureate Exam from the Scientific branch of high school. In general, there has been a lack of student applicants. The school was planned to handle about 140 students, which only occurred in 1975-76 and 1976-77. The Director of the Institute estimated that over 90 percent of the students come from rural villages and live in private houses in Aleppo while attending the Institute. Each student receives a stipend of S.£.150 (approximately U.S.\$38) to cover some of his living expenses.

The 20 permanent teaching staff of the Institute perform on a part-time basis in the afternoons after their jobs in the Ministry of Agriculture, the tractor factory, railways, University, and the Ministries of Education and Industry. One full-time person is employed

as an English teacher. Eleven former students act as laboratory assistants. Salaries are low, approximately US\$150 monthly as the base salary with a 20 percent bonus for being located in Aleppo, although this base salary increases somewhat with years of service. No in-service training is provided.

The curriculum of the Institute is oriented toward the manufacture of farm machinery with basic courses in electric systems and the internal combustion engine. However, due to the difficulty which graduates have in securing employment, modifications should be introduced into the curriculum and into the basic function of the Institute. The Institute should be producing graduates more oriented to the maintenance of farm machinery of various types and in the techniques of its use, rather than its manufacture. Certainly more job opportunities are available in the maintenance of machinery, and other agencies within the Ministry of Industry could probably provide the demand for people knowledgeable in the manufacture of machinery.

The facilities occupied by the Institute are shared with other Institutes in the Training Center managed by the Ministry of Industry. The laboratory space and facilities are, as a result, well equipped. However, farm machinery is limited to potato, sugar beet and cotton harvesters and some engines and cultivators. The Institute lacks instructors knowledgeable in tractor motors. There is no library nor is there land for the students to practice the use of agricultural machinery.

Conclusions. The Institute faces many problems similar to those encountered by other two-year institutes in Syria. Its graduates have difficulty in getting jobs, largely because of the orientation of the curriculum and the lack of practical experience. The faculty are part-time, and while they have good practical experience themselves, are often not up-to-date on teaching methods or the range of machinery in use in Syria, since they are limited to the machinery with which they actually work.

Consideration should be given (1) to altering the orientation of the Institute more toward maintenance of agricultural machinery and to the techniques of its use, (2) to providing the teachers with some in-service training opportunities, and (3) to securing access to land for actually experimenting with the machinery being studied in the course.

#### 4. University-Level Education

The three universities of the SAR are comprehensive, multidisciplinary and multi-professional institutions of higher education. They comprise a single system of quasi-autonomous campuses operating under the jurisdiction of the Ministry of Higher Education (MOHE). Professional education in agriculture is offered at each of the universities through their respective campus Faculties of Agriculture, at Damascus, Lattakia and Aleppo. A fourth agricultural program, managed and staffed by the University of Aleppo, is offered in temporary quarters at Deir-ez-zor.\*

Though differing from campus to campus in size, make-up and resources, these faculties nonetheless teach a uniform curriculum with a prescribed course of study for each of the four years leading to a baccalaureate degree in agriculture, and the graduate receives the title of "Agricultural Engineer." No provision is made for institutional diversification, or for specialization at the undergraduate level.

Postgraduate programs leading to advanced degrees, which all faculties are encouraged to initiate, are beginning to emerge along lines of different agricultural specialties, in accordance with both the interests of requisite numbers of students and the availability of staff and resources at each of the universities.

Until recently university functions of research and dissemination were made difficult by heavy undergraduate teaching loads. Low salaries often impelled professors to take on extra employment inside and outside the university, leaving little time or incentive for scholarly work or public service. In 1976-77 salaries were substantially increased; in addition, enrollments in agriculture were stabilized. These critical improvements, which have begun to encourage the start-up of programs of postgraduate education, have similarly begun to stimulate programs of research without which advanced education in agriculture would be sterile.

Since many of the features of university education are common to the four Faculties of Agriculture, we will describe those common features and then briefly describe each institution.

##### 4.1 Goals of the Faculties of Agriculture

In 1975, a Decree was issued which defined and organized the universities in Syria. The Decree clearly commits the universities to attacking the main development problems facing the country:

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\*A fifth institution for Veterinary Medicine is located in Homs, but time did not permit an assessment of its program and perspectives.



"Universities aim at achieving progress in the fields of science, technology, thought and the arts. They aim at contributing to the realization of the Arab National Goals and spreading and expanding the Arab Culture, expanding the fields of general knowledge and assisting in the economic and social development of Syria and the Arab Nation." (Decree No.1, January 31, 1975.)

The assistance of universities in the "economic and social development of Syria and the Arab Nation," however, has to date been largely limited to teaching undergraduates. Given the dramatic increase in enrollments, such an orientation had to be of first priority.

A second stage of university development involving attracting more teachers, construction of classrooms, laboratories and libraries is well advanced and should have the human and physical infrastructure in place within two years. The third stage is beginning even now, involving the refinement and broadening of the curriculum and the creation of specialized courses of study and the introduction of advanced degree programs to begin to train the trainers and educators in Syria, and in general become more oriented to the problems of Syrian development.

As the staff and facilities are put into place for teaching the approximately 7,000 undergraduate students in the Faculties of Agriculture, two additional teaching goals are being implemented, presently on a modest scale and eventually at a more significant level. The first is the training of graduate students in the Masters and eventually some Ph.D. programs. Some 25 students are presently studying for their Diplomas as prerequisite to their M.Sc. degree studies. One of the problems with this program has been the dearth of funds to get adequate faculty time devoted to it. Another problem has been the complete lack of national funding for true research (not just the translation of foreign research publications), which is essential to the training of the graduate students and the upgrading of the skills and knowledge of the staff. The national government's commitment to graduate training should become firmer as it becomes clearer that Syria can ill-afford to export its most talented individuals to receive a potpourri of training in areas of the world with little climatic or cultural similarities to Syrian agriculture or other fundamental activities of the society. The foundation of staff and facilities is being laid and in the near future the expansion of the training function is clearly perceived within the university. A strong commitment exists to generate the resources from national and international agencies.

Yet a third "training" function has been defined in the Faculties, although un-implemented as yet, namely that of upgrading the technical skills of farmers and technicians who work in agricultural agencies in Syria. Of particular interest is the idea of "family extension"



or home economics which would have women as its main focus. To date no funds exist for this purpose within the university, though some steps have been taken (particularly at the University of Aleppo) to open the university's walls to the community, including the rural community.

In addition to the three main teaching goals which the Faculty presently sees as important, launching a research program is of high priority. At present no nationally budgeted funds exist for research, and getting staff time freed for it is difficult. Yet the obligations of the university to engage in research are clearly defined in the Decree of 1975 on university responsibilities. The text of the Decree on the responsibilities of the university to implement the general objective quoted above is in part as follows:

"The following are the tasks which the Universities should undertake with a view to realizing these objectives:

- a. Raising the educational and training levels of specialists in all branches of knowledge, production and skills so that they will be able to keep up-to-date with current progress in Arab culture, knowledge and technology.
- b. Independently doing and taking part in scientific and other research that contributes to scientific and technological progress and that are particularly directed to finding solutions to the different constraints that are limiting economic and social development in Syria and the Arab Nation.
- c. Improving the rules and methods of research and teaching. This involves publishing and translating academic educational works and establishing laboratories for scientific research.
- d. Contributing to the constant improvement of teaching and training courses."

It is clear that the university has an obligation not only to become engaged in national development problems, but also to devote much of its resources to research on these problems and on serving the continuing educational needs of the country as a whole.

#### 4.2 Admissions and Student Support Policies

The number of students enrolled in the Faculties of Agriculture has dramatically increased in recent years. At the University of Damascus, enrollment has practically doubled from the 1600 students in the Faculty in 1972-73. At the University of Aleppo an equally dramatic growth has occurred, to the extent of having presently 2600 students enrolled plus 340 at the new Faculty in Deir-ez-zor. The University of Teshrine, created in 1971 with a freshman class of 700, now has a total of 1600 students enrolled. Practically

up to this year, these 7300 students were being taught in facilities designed for one-tenth of that number. Teacher/student ratios are lower now than previously, 1:31 at the University of Damascus, 1:41 at Aleppo and 1:33 at Teshrine. However, these ratios are a bit deceptive since the number of teaching staff is often substantially less than the number employed, since so many are on leave or working on their Ph.D.s. For example, Teshrine has only 16 full-time teaching staff, which means that the teacher/student ratio there is 1:100! These ratios compare with one of 1:45 at the Faculty of Agriculture of the University of Mosul in Iraq and 1:22 at the University of Baghdad.\*

Students gain admittance to the Faculties of Agriculture on the basis of their scores on the Baccalaureate exam (scientific section) which is a country-wide examination taken by all high school graduates who wish to go on to advanced study. The examination yields a certain number of points for each student. Those who score high go into medicine, the next group going into engineering, and the third group into agriculture. The fourth group go into general science. The range of scores which define these four groups differs each year according to the number of students who take the examination and the enrollment requirements of the different Faculties.

This system has the advantage of enabling the Ministry of Higher Education to control the flow of students into the various disciplines according to defined national needs and capacities. Its principal disadvantage is that students with little or no interest in agriculture and with no experience with rural life get assigned to agriculture as a lifetime career. Should they not want to enter the Faculty of Agriculture and should their scores on the exam not permit them to go into Medicine or Engineering, they can attempt to go abroad for their university education or they can go into one of the General Science specializations which rank below Agriculture on the examination hierarchy. However, due to the fact that the government guarantees employment to all graduate Agricultural Engineers, most of the students who score within the prescribed range enter the Faculties of Agriculture regardless of their personal interests or background.

The professors, then, have to try to motivate students to become Agricultural Engineers while they are in the university, and the governmental ministries have to incorporate people with urban backgrounds and experiences into practical agricultural work. This problem of getting students familiar with practical, everyday agriculture is probably the single greatest need of all the Faculties of Agriculture in Syria.

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\*Source: "The State of the Agricultural Social Sciences and Related Fields in Selected Countries of the ECWA Region," U.N. ECWA, 1978.

Many graduates with non-agricultural backgrounds do not work effectively with farmers. They often resist leaving the city to work for the Ministry of Agriculture in the countryside, in often isolated posts. The lack of practical experience severely limits the effectiveness of the students.

This problem of getting graduates into the field is especially severe for the women graduates who operate in a society where the family obligations for young unmarried women are strong and do not include independent living for the most part. However, these codes are evolving to encourage the professional training of women and, even though it is often difficult, ways are found to incorporate these women into professional work in agriculture once they graduate. The proportion of women in the Faculties fell slightly to about 10 percent of the last freshman class this year, which may reflect Ministry concern about having to incorporate women into their field staff.

The proportion of students with a farm background is not known precisely, although it was possible to look at the list of the 135 students who graduated from the University of Aleppo in the first semester of 1978-79 (these were students who had failed to graduate in the spring of 1977-78). Of these 135 students, 56 had home addresses in the urban areas, meaning that some 60 percent were from rural areas. The proportion of those who were actually sons and daughters of farm families is not known.

Since there are no tuition charges, the costs of attending the university are largely for food, housing and books. Most classes provide mimeographed notes of the lectures given by the professors and little outside reading is required, so that little time is spent by students to absorb materials in books. There are presently no dormitories with any significant capacity, although a decree is in effect authorizing the construction of dormitories. The lack of dormitories creates certain difficulties for students who do not have family or friends with which to live.

#### 4.3 Faculty Resources and Responsibilities

4.3.1 Incentives for University Staff: In an effort to provide the trained teaching staff which is needed to handle the dramatic increase in student enrollments in Syrian institutions of higher education in recent years, a Decree was issued in 1977 which raised the salaries of all university faculty to 200 percent of the standard public sector base salary rates. One objective of this Decree was to attract people with Ph.D.s into the universities, and this objective is at least partially being met. The three Faculties of Agriculture now employ approximately 175 Ph.D. holders (or candidates).



4.3.2 University Teaching Staff Responsibilities: In August 1977, Decree No. 1657 implemented new regulations concerning the rights and responsibilities of university professors. The Decree was the result of an extensive review of the situation of higher education in Syria concerning how to provide access to that level of training for large numbers of students and how to attract qualified personnel for providing that training.

The Decree defines three types of academic work: (1) teaching and related activities, including writing, translation, paper correction, etc.; (2) scientific research and related duties; and (3) administrative academic work, such as serving as departmental chairman, Dean or Assistant Dean. Also defined in the Decree are members of the "professional teaching staff" who also practice professional occupations. A full-time employee is considered to work no less than 39 hours per week, but this work can be administrative teaching, research or professional consultation.

In the case of professional consultation, in each Faculty it is also possible to create "Professional Practice Units" with the Dean of the Faculty as the head of such units. Such units are to perform in the interests of the public sector, with the university providing space and office equipment and the contracting agency providing resources as needed by the unit and as specified by the contract. The income of the unit is to be shared, 50 percent to the unit and 50 percent to the university. Due to the novelty of this idea, the details for carrying it out have not been completely elaborated. Problems obviously exist as to whether the staff who participate in such units can supplement their salaries with the funds secured, by how much and over what period of time. While still not completely functional, the Decree clearly paves the way for university teachers to engage in activities other than just classroom teaching.

Consideration is being given to the creation of a unit within the university structure which would be responsible for implementing the guidelines and procedures to encourage and regularize staff participation in these development related undertakings. Designed possibly on the model of a university extension division, such a unit, begun now at the earliest stage of university involvement in development activities, could help pace the institution's extramural involvement while at the same time helping to maintain a balance among the several functions and obligations of the university. One of its function, too, would be to begin forging the links of partnerships with the numerous outside agencies and constituencies essential to agricultural development.

4.3.3 Departmental Organization: The Faculties of Agriculture are organized into eight Departments: (1) Field Crops, (2) Horticulture and Forestry, (3) Soils, (4) Plant Protection, (5) Food Sciences, (6) Agricultural Engineering, (7) Agricultural Economics, and (8) Animal Husbandry.



TABLE 9: University Teaching Hours per Week

<u>A. Academic Administrative Staff</u>	<u>No. of Hours / Week</u>
Rector and Head of Teacher's Union	1
Deputy Rector	2
Other University Admin. Posts	3
Dean of Faculty	3
Assistant Dean	2
<u>B. Members of Teaching Staff</u>	
Professor	14
Assistant Professor	15
Instructor	16

A teacher at the University conducts his courses, but is also expected to prepare materials for those courses (writing of books covering the materials covered in the course), preparing and supervising exams and correcting exam papers. The preparation of written materials for the course in some Faculties represents some additional income, although with the present decree such work is considered part of the professor's teaching responsibilities covered by the 200 per cent bonus.

Should the faculty member desire to engage in research or consulting, there is an allotment of time for that purpose, for each type of faculty members.

	<u>No. of Teaching Hours per Week</u> <u>with Research</u>	
	<u>Responsibilities</u>	<u>Consulting</u>
Professor	6	11
Assistant Professor	7	12
Instructor	8	13

In order to further encourage scientific research in each Faculty, the 1977 Decree authorizes the creation of Research Units composed of one or more members of the staff. The Council for Academic Affairs has to approve the topics to be researched. The President of the University signs the contracts should funds come from non-university sources. The Head of the Research Unit reports to his departmental chairman, to the Dean of the Faculty, and to the Vice-President for Academic Affairs concerning the progress of the research project.

The Faculties of Agriculture offer sabbatical leave periods of from one to four years, although special efforts have to be made to secure funding for extended periods. Some special funds exist for travel abroad on short trips of one or two months. In general, however, the faculty member finds it difficult to attend conferences or take leave for upgrading his knowledge.

All full-time faculty have advanced degrees at the Ph.D. level (or are candidates for such degrees). The content of those degrees varies, however, since Syria has to send students for Ph.D. training to whichever countries offer scholarships. Some present-day faculty have received their training in Western Europe, others in the U.S. and Canada, others in the Soviet Union and other socialist countries, and others in other Arab countries. Even within these groups themselves, the variety of training at different institutions is great. The training received and the orientations toward the various disciplines across these groups of countries is greater still.

Difficulties are multiplied when returning staff with different language training attempt to incorporate the most recent materials into their courses. This diversity may make for an exciting intellectual climate, but the problems of coordination and access to scientific literature must be great. One obvious need is to re-integrate returning staff into Syrian conditions and harmonize to some degree the great variety of approaches and training received. Research and involvement in common practical development projects could be ways to achieve this end.

#### 4.4 Curriculum

In order ostensibly to achieve some standardization of the graduates of the four Faculties of Agriculture in Syria, the Higher University Council has decreed that the curriculum in each Faculty be identical. Each student takes six courses in each semester (the semester system is presently used in all Faculties of Agriculture, having been introduced first at Aleppo in the 60s). The courses taken by year and semester are shown in Table 10.

Although it is difficult to know what the specific content of each course is, it is clear that a student who finishes the eight semesters of work will have been exposed to a variety of topics, highly relevant, in theory at least, to the main agricultural production and processing activities found in Syria.

Most courses have, in addition to the lecture period, assignments in the laboratory or in the field. The extent to which these "practical" hours are actually experienced by the students varies with the instructor and the availability of laboratory space and equipment. A serious attempt is being made to structure direct experiences into the teaching environment, although one of the most commonly heard complaints about the graduates of the Faculties of Agriculture is their lack of practical experience. Some curricular and other adjustments should be made to correct this lack.

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TABLE 10: Curriculum of the Faculties of Agriculture

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Year 1:

Semester I

1. Chemistry
2. Mathematics
3. Foreign Language  
(English or French)
4. Botany
5. Physics
6. National Social Culture

Semester II

1. Agricultural Climatology
2. Plant Taxonomy
3. General Economics
4. Analytic Zoology
5. Analytic Chemistry
6. Organic Chemistry

Year 2:

Semester I

1. Principles of Fruit Production
2. Geology
3. Agricultural Economics
4. Principles of Field Crops
5. General Entymology
6. Biology

Semester II

1. Bio-Chemistry
2. Genetics
3. Plant Physiology
4. Soils
5. Animal Production
6. National Social Culture

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Year 3:

Semester I

1. Vegetable Production
2. Agricultural Machinery
3. Animal Breeding
4. Industrial Crop Production
5. Surveying, Irrigation,  
and Drainage
6. Statistics and Experimental  
Design

Semester II

1. Cereals and Legumes
2. Fruit
3. Poultry
4. Range Management
5. Plant Pathology
6. Farm management, Accounting

Year 4:

Semester I

1. Rural Sociology and Ag. Extension
2. Animal Nutrition
3. Soil Fertility and Plant Nutrition
4. Agricultural Cooperatives
5. Dairy
6. Pest Control

Semester II

1. Agricultural marketing
  3. Economic Entymology
  3. Food Technology
  4. Forestry and Ornamental Plants
  5. Apiculture
  6. Plant Breeding
-



#### 4.5 Post-Graduate Programs and Research in the Faculties of Agriculture

The Faculties of Agriculture have embarked on a limited Masters degree program (begun 6 years ago and presently enrolling 7 students in Aleppo and 12 in Teshrine) via first a diploma granted for one year's post-graduate study. The specializations currently offered at Aleppo are in Field Crops (in the Agronomy Department), Fruit Trees (Horticulture) and Irrigation and Soil Reclamation (Soils); the latter in conjunction with FAO, the Ministry of Agriculture and ICARDA. At Teshrine University, diplomas are being offered in Agronomy and Plant Protection.

The introduction of post-graduate courses of study make an adequate research program mandatory. The costs of such a program, however, have obliged the universities to go slowly with the post-graduate programs; each diploma costs about S.£.75,000 for teacher's salaries alone.

There are numerous examples of a new thrust in agricultural research in universities. The University of Damascus is presently designing an ambitious research project in the Department of Animal Husbandry. The University of Aleppo currently has four research projects underway. Each is being carried out in conjunction with international agencies: (1) the use of radio-isotopes in research on water movement in soils of various types, in conjunction with the International Atomic Energy Agency; (2) the control of cotton pests, in conjunction with FAO where Syria is one country in a multi-country project; (3) range management and the collection and reproduction of desert plants from the low rainfall areas of Syria, Jordan, Saudi Arabia and other nearby countries (in agreement with ACSAD); and (4) the production and disease problems of the Pistachio (also with ACSAD funding).

#### 4.6 University Extension

Given the universities' preoccupation with handling the flood of undergraduates and the resultant focus on undergraduate teaching, it might be expected that the involvement of the universities in the community at large through what might be called "extension" activities would be extremely limited. Such has been the case, at least in part, although significant efforts in the past three years have been undertaken to embark the universities on a community service course. One action which has shown results is the linking of various departments and staff through the establishment of scientific societies. In 1977, the Syrian Society for Solar Energy was created. The Arab Plant Protection Society was just recently created, with the participation of the Dean of the Faculty of Agriculture at the University of Aleppo on the organizing committee. Also at Aleppo, the History of Arab Science Society is now three years old; an Archeological Society is active in stimulating interest in the many excavations being conducted in the Aleppo area; a Graduate Alumni Association is active; a History of Science Journal is



being published; an International Symposium on the History of Arab Science was conducted in April of 1979; a magazine entitled "Science and Society" is published. Public lectures and films open to the public are sponsored by the University. A Research Institute on the Environment which will study the effects of the Euphrates Dam on the environment is being put into place in collaboration with the U.N. Program on the Environment.

Many professors and administrative personnel feel that these and other efforts, though admittedly small, nonetheless signify a commitment on the part of the universities to open their borders to broader involvement with the community and become less of an "ivory tower" sitting on the margin of the broad changes flowing through Syrian society. The restrictions on such an opening of the university are largely financial and procedural and not a question of policy; for example, the universities have no funds for running summer courses or short courses for adults, even though such an activity is clearly within their mandate. This problem, of course, derives from the priorities assigned to the use of national budgetary resources. During the next three years, once the extremely large and far reaching investments in physical plant are complete, ways must be found to finance a more complete use of these facilities through broader implementation of the universities' responsibilities in the country's development programs.

#### 4.7 Capacities of the Faculty of Agriculture at the University of Aleppo

The Faculty of Agriculture was established at the University of Aleppo in 1960. Presently it offers a B.Sc. in Agriculture and is developing a diploma program with seven students in Field Crops, Horticulture and Soils as a prerequisite to a Master of Science degree in these specialties.

Enrollments of students have increased dramatically in the past 15 years. The total enrollment figures for the past five years are shown in Table 11.

In general, the peak year as far as the number of students is concerned was 1976-77, most of whom are now in their third year of study. The new target figure for total enrollment is 2500, which would imply a freshman class of approximately 600 each year and would graduate approximately 300 agricultural engineers each year. The faculty has a total of 65 professors distributed among the standard departments. Six new faculty members have been recruited this past year and five are on leave.

Resources available to the Faculties of Agriculture are presently inadequate. The present space occupied by the Faculty's eight departments is clearly overcrowded, but a new building is soon to be completed and available. The general opinion in the Faculty is that

TABLE 11: Faculty of Agriculture at Aleppo

Year	Enrollment	No. of Graduates
1974-75	2028	225
1975-76	2360	261
1976-77	2629	229
1977-78	2592	307
1978-79	2560	

Foreign Students Enrolled:

Jordan	65
Lebanon	6
Sudan	12
Yeman	38
Palestine	33
Iraq	19
Turkey	1

The Four Classes by Sex (Present Enrollment):

<u>Class</u>	<u>Total</u>	<u>Men</u>	<u>Women</u>
First Year	599	539	60
Second Year	630	555	75
Third Year	696	610	86
Fourth Year	<u>635</u>	<u>566</u>	<u>69</u>
TOTAL	2560	2270	290

the space will be sufficient for classrooms, laboratories and staff offices. The building program at the University of Aleppo has been phenomenal in recent years, and the Faculty of Agriculture has been included in the expansion plans.

The Faculty has the responsibility of operating a 200 ha. farm some 20 km from the campus in Aleppo. The farm has a number of buildings already constructed. The farm itself is presently used primarily in the range management research project. The machinery on the farm are presently adequate, but should the land be more intensively used, other equipment will be needed.

The library is presently underused, given the course orientation to mimeographed lecture notes. It contains over 10,000 reference books and receives about 250 journals. Should more research be undertaken in the future and should the staff/student ratio become more favorable so as to encourage more individual study, the library would have to be re-organized and expanded.

#### 4.8 The Faculty of Agriculture at Deir-ez-zor

The various relevant agencies and ministries have decided to construct a new Faculty of Agriculture at Deir-ez-zor. The Faculty at Aleppo has been in charge of building the program and has provided the staff for the initial years of the new Faculty. Instruction was begun in the year 77-78 in a building loaned by the Ministry of Agriculture.

Including a second class which enrolled in the Faculty in 1978-79, there are now 340 students. It is planned to enroll another 150 students next year and have the majority of the students be from rural areas of Deir-ez-zor, Al-Rakka, and Al-Hasakeh. Presently there are 70 women students enrolled, who probably would not have been allowed by their families to go to Aleppo to the University but who had scored sufficiently high in their exam to attend the Faculty of Agriculture.

The same curriculum is offered as at Aleppo, and presently the Aleppo Faculty of Agriculture supplies the staff (who receive a bonus of about US\$250 monthly to travel to Deir-ez-zor twice weekly). No separate facilities are yet available nor is there a separate Dean or administrative apparatus. The importance of the establishment of the Faculty in Deir-ez-zor derives from the general strategy to extend educational services to the country as a whole and not restrict access to the larger urban centers. There is some question, however, whether at this time the additional 75 agricultural engineers are needed or can be gainfully employed.

#### 4.9 The University of Damascus Faculty of Agriculture

Damascus University is the oldest and largest of the three institutions of higher education in Syria, its roots going back to the founding in Damascus of the Medical Institute in 1903. Following mergers, additions, and the creation of new faculties over time, the enlarged institution was renamed Damascus University in 1958. At present it has 12 faculties of its own, and a number of Intermediate Institutes associated with it.

A High Institute of Agriculture, established in Damascus in 1960 by the Ministry of Education, became the Faculty of Agriculture of Damascus University in 1963. Its departments are Agricultural Biology, Agricultural Economics, Animal Husbandry, Food Sciences, Plant Production, Plant Protection, Soils and Agricultural Engineering. Ninety-five faculty members are now (76-77) part of the Faculty, and enrollments have reached a total of 2950 (see Table 12).

The Faculty has moved to a new site, 10 ha. in size, where it has buildings for classroom instruction and for administration. Its former campus and farms, some 75 ha. in size, at a distance of 18 km, continue to be used for teaching laboratories to which students must be bused on regular schedules. The outdated buildings, equipment



and laboratories of the old campus have questionable educational value; thus, improvements in laboratory instruction and demonstration await further developments and installations on the new site.

TABLE 12: Enrollments and Number of Staff at the University of Damascus

Year	Faculty of Agriculture:			Total University:		
	Students	Grads	Staff	Students	Staff	Graduates
72-73	1605	88	43	36,250	697	3665
73-74	2010	182	50	38,100	705	4194
74-75	2553	212	75	44,200	884	4731
75-76	2690	235*	79	N.A.	N.A.	N.A.
76-77	2950	390*	95	N.A.	N.A.	N.A.

\*Estimated, data not available.

A generalist degree, B.Sc. in Agriculture, is awarded to all graduates, who also receive the designation of Agricultural Engineers. Similarly, provision is made for a post-graduate diploma course which could lead to entry to a program of specialized study at the Master's level, but thus far at Damascus University the program has not gotten underway for lack of a requisite (six) number of candidates.

Because of heavy teaching loads faculty have little time for research or for professional experience; some are required to teach at other institutions. This situation may begin to improve due to the fact that limits are being placed on the numbers admitted to the study of agriculture. Also, faculty are returning from overseas courses of graduate study (though some are also being lost to other countries in the region).

Staff and administration alike expressed positive attitudes toward taking part in research, extension teaching, and post-graduate professional education, whenever favorable conditions develop.

#### 4.10 Faculty of Agriculture at Teshrine University (Lattakia)

In the year 1971 the Faculty of Agriculture was formally separated from the Faculty of Arts and Sciences, and began with approximately 400 students. In 1972 over 700 new students were admitted, and about 300 are admitted yearly, with some variations from year to year. Table 13 shows the enrollments for 1978-79.

The administrative officials estimated that of the 450 students presently in the first year, approximately 180 will complete their studies in four years. It is also estimated that about 60 percent of the students presently enrolled come from rural communities, although direct data on student origins is not readily available. As



TABLE 13: Enrollments for 1978-79

Year	No. of Students
First Year	450
Second Year	350
Third Year	300
Fourth Year	300
Enrolled but not Attending	200
TOTAL	1600

in other Ministry of Education administered institutions of higher education, the students receive no scholarships or stipends, nor is housing supplied, although the Government has approved the construction of dormitory facilities in the coming year.

The curriculum is identical to those of the other Faculties of Agriculture (see Table 10 for a complete list), with the Faculty producing graduates with the title of "Agricultural Engineer."

Presently there are nine students enrolled in the diploma program in Agronomy and nine in Plant Protection. However, experience has shown that most students will drop out of the program should they find employment meanwhile. Those who receive the diploma do not receive extra pay nor do they start higher in the bureaucracy than those who began to work immediately after graduation and do not spend one additional year studying: both types receive equal pay. Practically all graduates eventually secure government employment, after serving their military obligations.

The teaching staff is composed of 16 full-time faculty members, all of whom either have their Doctorate or are candidates for it. The number of faculty members in each department is shown in Table 14.

TABLE 14: Number of Faculty Members by Department in the Faculty of Agriculture at Teshrine University

Department	With Ph.D.	Candidate
Agronomy	2	1
Plant Protection	2	1
Economics		2
Soils	1	
Food Technology	1	1
Rural Engineering	1	1
Horticulture	1	1
Animal Husbandry	—	1
TOTAL	8	8

Each teacher gives at least two courses. Salaries range from S.£.1700 monthly for beginning faculty to S.£.3500 monthly for full professors. There are presently 22 members of the Faculty who are studying abroad, mostly in England and France. Clearly the number of resident staff has to be increased, and once these 22 staff members return, the teacher/student ratio will be more reasonable than the present 1:100.

The physical facilities of the Faculty are presently inadequate, although a new building should be available next year. The new building will offer approximately 57,000 m<sup>2</sup> to serve a total of 3000 students in contrast to the approximately 1000 m<sup>2</sup> for the 1400 students presently enrolled. The Faculty has been occupying lecture halls shared with a religious organization. The laboratories are overcrowded, but the new space will include two laboratories for each of the eight departments plus ample staff offices. The only library facilities are those offered in the main Library of the University.

The Faculty is clearly interested in developing an active research program, although efforts to date have not been very extensive. A proposal has been submitted to the Prime Minister to construct a number of experimental farms in the different micro-climates of the area around Lattakia, including the Mohafazat of Idelb, Lattakia and Tartous where some of the most dramatic changes in climate and topography can be found.

#### 4.11 Problems of the Universities

The Faculties of Agriculture still face basic problems of having enough teachers, classrooms and libraries. However, it is possible that those problems will largely be solved in the near future. What remains are the more intractable problems of generating quality education in the service of Syria's national development.

4.11.1 University Incentives for Research: While decrees exist which state on the one hand that one of the primary functions of the university is to engage in scientific research and participate in solving Syria's development problems, and on the other that university professors are expected to devote themselves to research along with training and professional consultation, to date not many professors have moved out of the classroom. The limited number of teachers still is a problem, but probably a temporary one should present plans materialize.

Another more immediate problem is that of incentives for faculty members to engage in research, extension and rural development. Advancement is mostly a question of spending five years at one level before being promoted to the next. Research is considered in promotions, but research often means translating foreign research publications

and not the engagement of the professors in a coherent, long-term research effort. Community service is not considered. Moreover, for those teachers who have access to professional work (doctors, dentists, engineers), time spent in development projects outside the classroom simply subtracts time from that which can be spent on consulting or clinical work. Restructuring faculty incentives is a priority need for getting available university personnel involved in research for development and for the training of future teaching staff itself in the post-graduate programs.

4.11.2 The University as a Place of Contemplation: Universities are still viewed by most public functionaries in Syria as either teaching factories or places of seclusion and contemplation. These widespread views hold the university to be largely irrelevant to social, economic and agricultural development needs of the country. University professors are thought to be little more than well-meaning rather fortunate people who because of their foreign training and orientations have little practical knowledge to offer a Syrian farmer, program planner or administrator.

Unfortunately, this view contains more than a kernel of truth; but, as has been demonstrated in a number of countries, steps can be successfully taken (1) to create an indigenous post-graduate training program to produce the Masters and Ph.D. level people trained in problems of Syrian development, and (2) to draw on experienced and committed faculty in initial efforts at creating collaborations between universities and governmental action agencies.

The University of the Philippines has organized, for example, a Center for Policy and Development Studies to draw together university staff with "policy makers, business executives, farmers and community leaders." The Faculty of Agriculture of Las Villas, Cuba, participates "in rural development by organizing demonstration and research work in stations located in large State farms where experiments are organized as part of large-scale production technology.\* What the universities of Syria lack are budget items to fund such activities and administrative flexibility and authority to allocate resources to these activities.

4.11.3 Theoretical General Orientations of Students: The students who graduate as Agricultural Engineers have a standardized, general training of a mostly theoretical nature. Little practical experience and little specialization is included in the training for the undergraduate degree.

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\*Source: "The Contribution of Agricultural Faculties and Universities to Development," FAO, Rome, 1977.



These shortcomings undoubtedly carry over into the work which these students undertake upon assuming their governmental positions. Farmers often in fact know more than the university graduates about specific agricultural activities. Status differences and insecurities make interactions between the university graduates and farmers difficult. The ultimate users of the technology which the graduates have studied, the farmers of Syria, are often cut out of the information system which these graduates manage and which feeds into decisions farmers must make about production, and which planners and administrators make concerning research, dissemination, and the design of agricultural development projects. The practical, specialized knowledge of the fieldworkers of the MAAR and other governmental agencies must be improved in part in the universities in order to better establish the necessary communication linkages. Furthermore, specialization would enable the Engineers to begin working effectively immediately, rather than go through an on-the-job specialization training as more the case. Bakour\* notes that in Jordan 70 percent of the Agricultural Engineers hold specialized studies licenses, while in Syria 10 percent are specialized coming out of the universities.

4.11.4 Difficulty in Estimating the Demand for Agricultural Engineers: The University Council has a difficult job of estimating the real demand for agricultural engineers. Since 1975 the government is by decree obligated to hire all agricultural engineers within six months of graduation. The recent dramatic increase in graduates is only now being felt, since most have been fulfilling their military obligations. However, the problem of placing all the agricultural engineers is not perceived to be a very serious one, at least not yet. The estimated yearly production of each Faculty is: Aleppo, 300; Damascus, 300; Lattakia, 200; Deir-ez-zor, 200; for a total of 1000 agricultural engineers yearly, which seems excessive. The number of graduates this year will be somewhat less than 1000, probably about 650, which is more reasonable.

However, estimating what is reasonable is itself difficult. There are a number of procedures for making such estimations, none of them very satisfactory. One is to assume that most engineers will work for the MAAR in the field and simply calculate the number of technicians required to "extend" agricultural information to farmers, either on the basis of the number of farmers there are or by taking some proportion of irrigated and non-irrigated land used for farming. The problem with this procedure is that it is difficult to make general rules, since the conditions vary and the types of farm families and enterprises are so numerous. Standards developed for one country or one region may have little relevance to another. Furthermore, the actual extension program presently envisions a total of 156 extension units, requiring at most three engineers each. Should more of a field presence be required, of course, more engineers will be needed.

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\*Bakour, Yahia. "A Study of the Syrian Arab Republic's Demand for Agricultural Engineers During the Period through 1985," (no date).



This is really a second approach to manpower projection, namely to take the stated requirements of the different institutions and agencies which employ agricultural engineers, and aggregate the projections of these individual agencies into a single country-wide projection. The problems lie in the weaknesses of the individual projections, and with the difficulties in getting all relevant projections.

A third approach is to simply project past employment trends. Again, data are lacking, but some idea could be gotten of likely future levels. The 1975 decree guaranteeing employment would create problems for this procedure, however, since the large increases since 1975 in the number of employed engineers would be a result of the decree and not of increased job availability.

The projected needs for engineers should be carefully monitored, despite the difficulties, since so many resources are involved. Follow-up studies of graduates would be desirable, as would complete studies of the real needs of various ministries.

## 5. Summary and Conclusion

The SARG has wisely assigned to popular education a central role in its development schemes for the nation. Systematically and repeatedly it has allocated substantial portions of its resources to the construction and expansion of an entire educational system comprising primary schools, secondary schools, and schools of vocational and technical education at both the secondary and post-secondary intermediate levels. Also it has created and staffed, as the capstone institutions of the system, three multi-purpose universities with responsibility for four faculties of agriculture.

In the space of a little over three decades of existence as an independent state, and in spite of political and military interruptions, Syria has laid down an impressive educational foundation upon which to "ensure the continued progress of the people and meet the needs of their continued social, economic and cultural development."

At the same time there is recognition that this record of accomplishment represents only a good beginning. Efforts of the past will now need to be redoubled in the face of rapid population growth, rising educational expectations among the people, and the high illiteracy rates still prevailing. Educational planning will need to continue long into the future.

But quantitative education growth will not suffice. Reform and re-orientation are also called for. Vestiges of the educational system's former dependency patterns must be eradicated, to be replaced by goals, forms, and processes more useful to the indigenous needs of the nation.

Nowhere is this transformation needed more than in the agricultural sector where productivity is steadily declining at a time when agriculture is depended upon to produce more food and fiber for a growing population, provide employment for an expanding rural work force, and generate exportable surpluses to support purchases abroad while maintaining a favorable balance of trade.

The best and most lasting changes will be those which emerge from within the system rather than those attempted from without. It is in the powers of the SARG authorities to establish the conditions and create the climate out of which reforms will grow. A blueprint cannot be designed in advance but some suggestions are offered here as starting points. The two central agencies needing most attention are the ministries which share responsibilities for education, and especially for vocational and technical education, and, the universities, which as the pinnacle institutions of learning, hold the key to unlocking the processes of national development.

It will be helpful to point out at the start that agricultural productivity and national institutional development cannot proceed independently of each other. They are interlinked. Productivity will not grow merely through the presentation of new facts to the farmer, or to his children in school. Nor will the infusion of technology into the agricultural processes of the farm suffice in and of itself. These efforts must take place in a receptive setting conducive to overall rural development and welfare. That is to say that individual and social (structural) progress must go forward together.

### The Ministries

Responsibility for technical and vocational education is diffused among numerous ministries of the SARG. Taken together, their separate independent and autonomous efforts do not add up to an effective overall scheme for balancing manpower production with national manpower needs. Unification of effort is called for. This can be accomplished through transfer of responsibilities to a single ministry or agency. Alternatively, if transfer is not feasible, some coordinating mechanism can be created on an experimental basis, allowing for adjustments to be made from time to time in the light of developing experience. But articulation among the disparate parts is a prime necessity, however it is accomplished.

Some of the objectives to be served by greater coordination can be enumerated briefly:

1. To begin with, coordination should aim toward the establishment of high standards of pedagogical professionalism common to all persons engaged in dispersed educational enterprises. Professional preparation and attainment should be expected horizontally in the ministry echelons and vertically among teachers and administrators in the schools and agencies under their jurisdiction.

2. Coordination should lead to the sharing of those educational goals and directions which are common to all enterprises, and, to the greater understanding of goals and directions which are unique to particular agencies and institutions.
3. Common needs and services could be systematized and rationalized. Among others these include the professional preparation and continuing education of teachers, administrators, and specialists; the provision of guidance and counselling services; systems for follow-up of graduates and other school leavers.
4. Economies of scale could be effected in the purchase of equipment and materials and in the preparation and production of text books, syllabi and audio-visual material.
5. Experimentation can be encouraged, and successes and failures can be analyzed for the lessons they provide to all relevant sectors of the system.
6. Coordination can be expected to heighten awareness of wasteful competition, or duplication, or of unmet needs.
7. Finally, communication networks can be created to link appropriate parts of the educational system, thereby reducing the sense of alienation and isolation and replacing it with a spirit of common endeavor in the national interest.

### The Universities

Like their counterparts in other lands, the three universities of the SAR, though created relatively recently, already represent the greatest concentration of highly trained manpower and educational facilities in the nation. Their growth has been rapid in size, scope, buildings, equipment and staff, but not rapid enough to keep up with the buildup in numbers seeking university instruction. Thousands of students unable to be accommodated in the overcrowded Syrian universities have gone without advanced university training or have gone abroad for their postsecondary education.

Under conditions of high student:teacher ratios, it is not surprising that agricultural faculty personnel, for example, have concentrated almost exclusively upon the basic task of teaching undergraduate students. Until recently little time, energy, or motivation have been left for the demanding tasks of research or graduate instruction, let alone for extramural functions of extension, outreach or dissemination.

Yet there is a growing worldwide consensus, to which the writers of this report subscribe, that universities must assume responsibilities in agricultural and rural development which go beyond their traditional functions of teaching, and the scholarship associated with that teaching.



In addition to these traditional functions, universities in Syria must reorient themselves in ways which directly confront national development problems and make those problems the proper subjects of their study, research and teaching. In this way they can ensure that their teachings are relevant to national needs and that their graduates are adequately prepared to cope with those needs when they assume responsibilities in the operational world.

In the process of confronting problems of national development, universities will bring themselves into the formulation of policies and strategies for agricultural and rural development, engaging not only their technical and scientific departments, but also the social sciences, humanities and cultural resources uniquely available to them.

The universities' outreach programs should also relate directly to problems of farmers. Both to gain credibility with them, but also to learn about farmers and their problems firsthand, faculties should create linkages to work with the farmers and with the agencies, ministries and associations which deal with farmers. This kind of work would help to train and motivate faculty and students who lack direct experience in agriculture. It could also provide feedback mechanisms which can define and target research projects, teaching and, eventually, dissemination of knowledge.

Through these experiences faculties will gain expertise which will prepare them to provide in-service training, both formal and informal, to the hundreds of professional and paraprofessional personnel whom they should regard as their proper constituents.

This basic reform of agricultural faculties and universities is inescapable if the potential benefits of staff and physical facilities, obtained by the nation at such a high price, are to be maximized in the national interest. Moreover, only the universities have the wide range of expertise required by the processes of development, both in their technological agricultural aspects as well as in their social, human and cultural manifestations.

What is proposed here is not the supplanting of other agencies and instrumentalities, but rather the creation of fresh cooperating arrangements, wherein the universities assume major new roles.

Neither is it intended that faculties of agriculture and universities retreat from responsibilities for preparing trained agricultural engineers and other personnel needed to fill the critical manpower requirements of the nation. On the contrary, involvement in the dynamics of agricultural and rural development will better adjust the numbers, specialties and experiences of graduates to those requirements of the country. Moreover, in their programs of in-service training, the universities should be able to provide to the current generation of agricultural operatives and decision-makers the best modern and scientific tools available.



Elsewhere in this report mention is made of the decrees and regulations that now exist to authorize this enlarged function on the part of the universities. Also mentioned are some of the commendable steps already taken by the universities toward this goal. It remains for the SAR authorities explicitly to take steps which permit, encourage and energize this progress in the reorientation of the universities.





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